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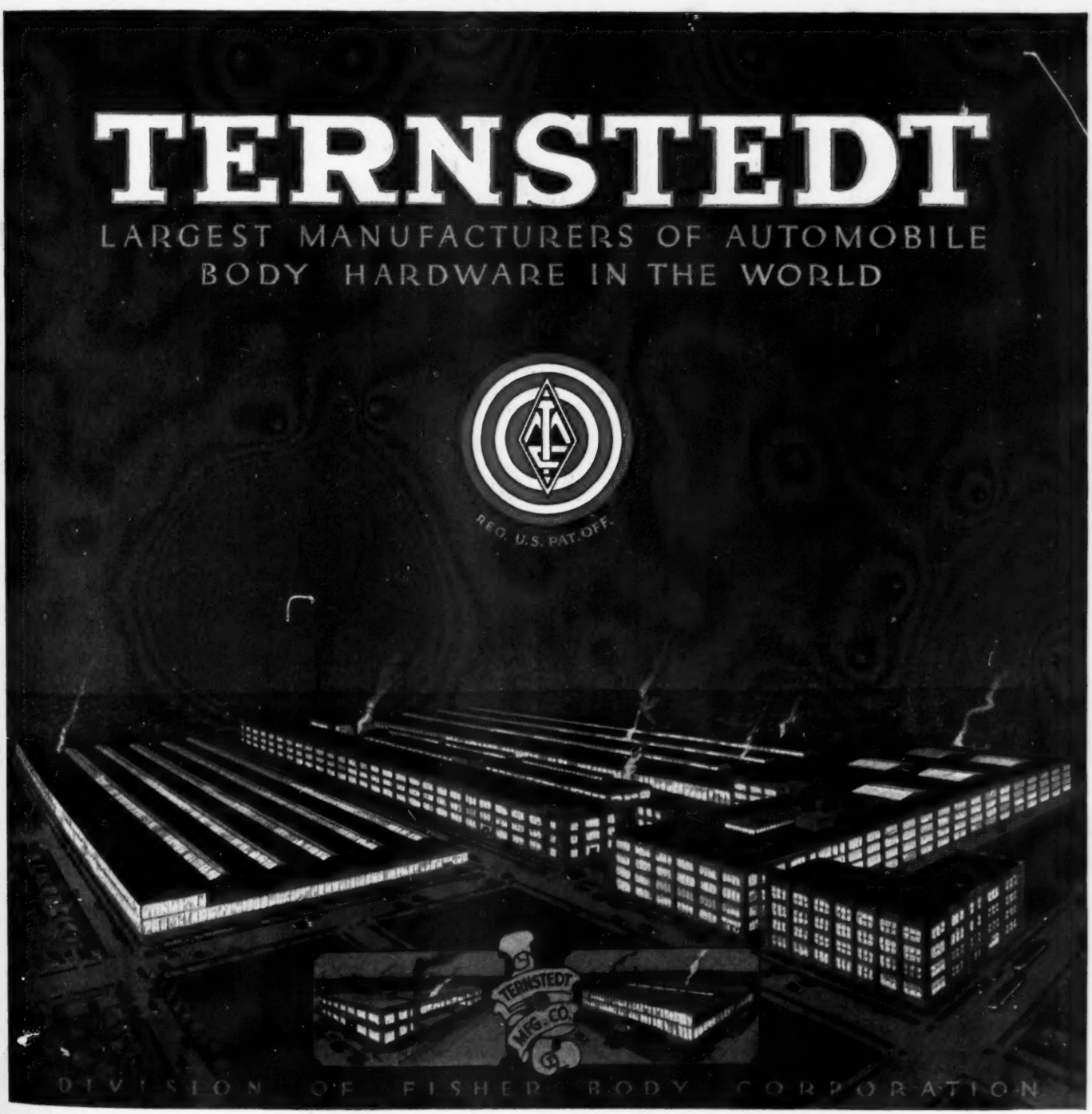

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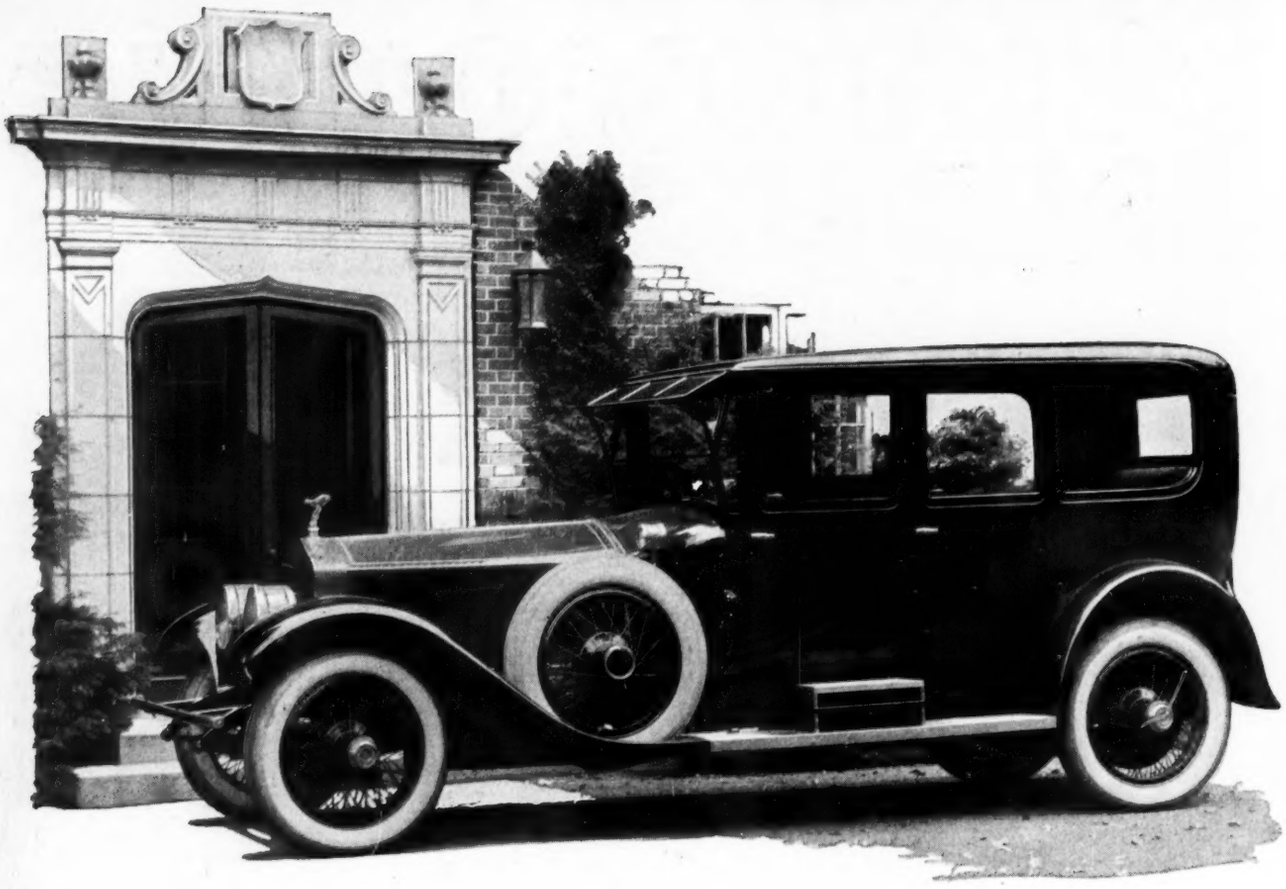

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AUTOMOTIVE INDUSTRIES
The AUTOMOBILE

VOL. 50 NEW YORK—THURSDAY, JUNE 5, 1924 NO. 23

Retail Sales Increase Gradually as Production Marks Time

Automotive ship sailing forward on even keel. Conditions vary greatly in different territories, but general trend is favorable. Dealer profit margin small.

By Norman G. Shidle

THE automobile sales curve for May is full of hills and valleys. Business is exceptionally good in some parts of the country and relatively poor in others. Reports from all over the country show surprisingly different situations, sometimes in territories quite close to one another. May has not brought about any marked increase in sales, taking the country as a whole, but steady advances have been made in some places.

Manufacturers are in excellent condition at the present time. Most of the car and truck builders have proceeded cautiously for some months and, as a result, have their inventories and vehicle stocks in good shape. The retailers have not been quite so fortunate, except in specific instances. Heavy used car stocks are on hand in a number of cities and a considerable decline in dealer profits has occurred generally, often despite the fact that volume of sales equals or exceeds that of the same period last year.

Speculation about price changes is rife among dealers. Some retailers feel that even the slight increases which already have gone into effect are setting up added sales resistance, while others are enthusiastic about the advances on the theory that they have placed dealers in a better position to get good prices for used cars. As a matter of fact, price rises may not be so general in the next few months as was expected because of important announcements a week or so ago. Several well-known executives have said since that time that they do not look for any material advances in general and that the price of their particular car will remain where it is until further notice. Other price increases however, seem likely.

That vehicle manufacturers are on the right track in making greater efforts to educate dealers and to give them practical assistance in handling their business efficiently is borne out by the fact that lack of proper management is taking its toll of dealers in many towns. With selling costs rising and used cars becoming more troublesome, efficient management is spelling the difference between red and black ink in numerous cases.

Dealer mortality has been considerable during the last few months in some sections of the country and a large proportion of the deaths can be traced to inability to operate the details of a business correctly.

Some close observers incline to the belief that dealer organizations have been increased in sizes so rapidly and dealer territories cut down so much in recent years that even a reasonably efficient retailer has difficulty in

CAREFUL study of specific areas is necessary to a full understanding of current automotive sales conditions. Detailed reports show cases in which the situation varies greatly in adjacent territories.

making a good living. While this may be true in some cases, it is evident that certain classes of manufacturers have not yet expanded their dealer organizations to as great an extent as they profitably might do.

Evidence that careful management is one of the most important factors needed to meet the present situation in the retail field is given by the records of several dealers for the same car in adjacent territories, the character of which is similar. One large dealer made greater profits in April than in any April for several years past, while several other organizations handling the same car report difficulty in making ends meet.

Used Cars Troublesome

While the used car situation is troublesome and the market for such vehicles is glutted in a good many places, there are several bright spots, one of which is in Cleveland. There stocks of used cars are 50 per cent less than they were a year ago. This favorable condition is believed to be due largely to the efforts of the used car bureau of the Cleveland Automobile Manufacturers and Dealers Association. In Cincinnati used cars have been moving well but prices have been low. Excessively heavy stocks of used cars are reported in Iowa. A report from Texas says that there has been a thriving business in used cars in all parts of the State and that it "begins to look as though Texas retailers will make a specialty of this line of trade, first rebuilding the machines and then standing behind them with the reputation of their organizations."

> DEALER problems are the most important ones before the manufacturer to-day. Economic pressure is making it necessary for the retailer to run his business properly or have his balance sheet record a loss. Educational work and merchandising help from the car builder will be big factors in keeping dealer organizations intact.

Lack of adequate profits in the dealer field is perhaps the most serious phase of the present business situation. The N. A. D. A. slogan of "5 per cent net profit in 1924" is far from being realized in a majority of cases. Doubtless the dealer himself is responsible for most of his failures, but that does not alter the fact that the manufacturer cannot go ahead successfully unless his retailers do make money.

Increased sales costs, excessive overhead, inadequate bookkeeping and stock records, improper handling of used cars, and a general slowing up in business are among the chief reasons given for the dealer's failure to make a proper return on his investment. Parts of this list are very similar to those which might be given of things which are troubling the manufacturers. Basically speaking the problems of the entire automotive business are the same. As the manufacturer finds some means of solving the questions which confront him he can improve the entire situation materially by passing along to his dealers all of the information and experience which he has gained.

A few makes of cars are selling well in almost every section despite the general decline in business.

The higher priced cars in general are feeling the effects of slack buying to a greater extent than are the lower priced vehicles. In one or two territories, for example, several dealers for certain large production low priced cars already have done as much business in 1924 as during the entire year of 1923. This condition is not general, of course, but gives an illustration of the progress being made in some of the lower price groups.

While the well-known weather still is being given credit for much of the trouble which has befallen the automotive industry in the last few months, it becomes increasingly apparent that the effect on general business conditions is of far more importance.

Production has slowed down in many lines and an increase in unemployment has tended to further decrease buying power. The weather has been an important factor in agricultural districts where it has affected crops adversely and, as a result, made the farmer a less likely prospect for the automobile salesman. Steel production has dropped sharply and slowing up is reported in other manufacturing lines. The situation throughout industry is much akin to the automotive situation; production is being held up pending an increase in buying.

A strong thread of optimism runs through all of the business summaries, however, and there is a general feeling that the bottom will be reached within a few months. United Business Service summarizes the situation aptly as follows: "With contraction in buying power entering as a new factor in the price situation, any price strength resulting from a general curtailment program will be reduced considerably and nothing more than a moderate firming of markets therefore need be anticipated."

A continuance of the conservative policy which has been common among automotive manufacturers in recent months seems to be all that is needed to insure a reasonably profitable year in 1924. The general practice is to watch carefully detailed reports from various sections of the country and to concentrate efforts in those territories. The wide variation in trend of sales between different areas is well illustrated by reports just received from St. Louis and Kansas City, Missouri. Sales in the Mound City of both new and used cars "have picked up during the last month and dealers are well pleased with conditions. Due to continued merchandising effort, sales are being made on a profitable basis. Dealers are 'selling' new cars and are not 'buying' old ones."

In Kansas City, however, "only a few motor car dealers are making money this year so far. Sales of new and used cars are much below normal."

Sales Govern Production

Car and truck production will be governed in coming months almost entirely by the course of retail sales. On this basis there is little likelihood that June will show any marked increase of May. Better weather probably would stimulate sales to some extent but its effect is scarcely likely to be so great as to call for much increase in production schedules within the next 30 days. The large number of new models which are pending also will tend to keep production down for the time being in order to let the dealers get current types off their salesroom floors. Announcement dates will depend very largely on the trend of retail sales.

A detailed survey of sales conditions in various territories appears in the news columns of this issue beginning on page 1242.

New Tax Bill Should Have Favorable Effect on Automotive Sales

Lower payments required from small incomes will release money in car buying groups. Relief may be only temporary, however, because of other unfavorable items.

By J. K. Lasser, C.P.A.
Tax Counsel, United Publishers Corporation

THE vast amount of legislation vitally affecting business which has come before the present Congress makes it essential that industrial executives give close attention to political moves and that they express their conviction clearly and persistently to the men who represent them in Washington.

This article gives a brief analysis of what the new tax bill means to the automotive industry both from the standpoint of immediate sales and of permanent development.

IT was with relief that the automotive industry watched the final passage of the Revenue Act of 1924 and its acceptance by the President on Monday. Admittedly, the scientific and sound revisions of the original bill which were instigated by Secretary Mellon were woefully mutilated in the partisan legislation that came from the conference. Yet the omission from the completed measure of such vicious monstrosities as the Jones and Norris amendments afford, if not gratification, at least some solace and comfort.

To the automotive industry the bill has extended genuine aid. Practically, it has afforded a decrease in the irritating excise tax on accessories and parts. And morally, coming at a time when output has been curtailed as the result of overproduction during the early part of the year, the exceptional decreases in the tax upon smaller incomes will be a decided inspiration to trade. But the effect of the bill in this regard is very likely to be temporary, if at all measurable, for the new law has not removed the restraining interference of the burdensome surtax.

The bill ministers and champions the cause of the smaller taxpayer to the tune of a vote-seeking relief which grants a reduction of approximately 60 per cent of the taxes assessable under the 1921 act. Specifically it does these things:

1. The normal tax (Section 210) previously assessable at 4 per cent on the first $4,000 in excess of the credits of Section 216, and 8 per cent on the balance, was reduced to 2 per cent on the first $4,000 in excess of the credits of Section 216 (see below), 4 per cent on the next $4,000 and 6 per cent on the balance.

2. The credits previously allowable under Section 216 were so amended as to grant a specific exemption of $2,500 to all married individuals or heads of families. In the 1921 act only those earning less than $5,000 were permitted to take $2,500; all others $2,000.

3. Section 209 effects a credit of 25 per cent of the computed tax upon all "earned income," this being rather generously defined as being "wages, salaries, professional fees . . . and in the case of a taxpayer engaged in a trade or business in which personal services and capital are a material income producing factor, a reasonable allowance for services . . . not in excess of 20 per cent of his share of the net profits. . . ." Earned income is limited to $10,000, but it is stipulated that if the taxpayer's net income is not more than $5,000, his entire net income shall be considered to be "earned net income," and if more than $5,000, his earned net income shall be not less than $5,000.

4. Surtaxes as imposed by Section 211 of the act have been particularly reduced in the lower brackets. The old act provides a 1 per cent tax on incomes from $6,000 to $10,000, 2 per cent on $10,000 to $12,000 and a 3 per cent levy on $12,000 to $14,000, whereas the revision stipulates a 1 per cent tax on $10,000 to $14,000.

In addition to the foregoing, all of which affect taxes assessable subsequent to Jan. 1, 1924, the much sought reduction in 1923 taxes (i.e., those payable in 1924) was effected through Section 1200, whereby all taxes (including both normal and surtaxes) for 1923 are reduced by 25 per cent. In view of the fact that the higher surtax brackets were reduced by only 20 per cent, the net result is that taxes for 1923 will, for the higher incomes, be even less than the 1924 toll.

Low Incomes Benefited

When it is realized that of the 4,000,000 taxpayers scheduled to report incomes for 1924, almost 95 per cent are among those who will no longer be waylaid by the surtax and who now will be assessed by a tax some 60 per cent less than they have been paying for five years, it will be appreciated that the immediate psychological effect upon sales will be satisfactory. The 1924 remission of 25 per cent which had, in most cases, been counted due, payable and lost, has even the more practical result of releasing money which normally would be tied up awaiting tax payments.

Despite the energetic measures of Secretary Mellon, and behind him practically the entire business of the country, the proposed reduction of surtaxes to a maximum of 25 per cent was defeated. Instead the conference finally re-

ported a bill containing a maximum of 40 per cent, a 20 per cent reduction from the 1921 levy of 50 per cent. The universally sought amendment to the constitution permitting a tax upon the now exempt income from securities of States and their municipal subdivisions also was lost in the shuffle.

As a result, since it is granted that the 40 per cent tax will be no easier to collect than the 50 per cent, the gradual diversion of capital into the unproductive channels that yield revenue neither to the Government nor to the taxpayer, but are simply legal prudent avoidance, will continue with increasing force. In fact, of all of the arguments propounded as to the growing difficulty of issuing corporate securities for railroads and industrials without paying a prohibitive interest rate, no attempt was made to readjust the basis of taxation to its sound principles.

While the flotation of securities within the automobile industry has been accomplished without any remarkable difficulty in late years, yet it too has felt the growing menace that tax exempt securities have fostered in the guaranteed increase in return that has consistently moved up in competition with tax exempts.

Bonds, Tax Exempt and Taxed

It is indeed a peculiar type of legislative ability which cannot appreciate the fact that an individual subject to 40 per cent surtax finds it much more profitable to invest in 4 per cent or 4½ per cent tax-free securities than to risk his capital, initiative and energy in an industrial enterprise yielding profits of which 40 per cent must go to the Federal Treasury. And it is a narrow-minded legislator who cannot comprehend that the natural divergence of wealth to refuge in tax-exempts rather than to a 5 per cent to 8 per cent return from railroad or industrial bonds gradually will force up the rate of return of the latter (thereby increasing the cost of the commodity to the ultimate consumer) in order to attract the investor.

The conference elimination of the Jones Amendment which proposed to compel under penalty the substantial distribution of all profits by a progressive tax upon undistributed earnings was the outstanding victory of industrial interests. The amendment apparently ignored the fact that profits comprised inventories, machinery, buildings, accounts receivable and other non-cash items, which could not be liquidated for distribution without demoralizing the business and causing a loss to investors far beyond the momentary distribution it would have enforced. Under its provisions the reinvestment of profits in business would have been seriously penalized.

Will Not Publish Tax Returns

The scrapping of most of the iniquitous Norris Amendment providing for the complete opening of all tax returns as public records was, in similar fashion, extremely welcome. It proposed to remove the constitutional guaranty of privacy and would have subjected the personal affairs of the taxpayer to the scrutiny of busybodies, gossips and the maliciously curious, laying the road open to a new type of industrial friction, not to say public slander and blackmail. A mere vestige of the original radical plan remains with the "peeping Tom" bill as it now stands (Section 257), providing that lists shall be prepared containing the names of the taxpayers and the amount paid, which shall be open for inspection in the office of Collectors of Internal Revenue "and such other places as the Commissioner may determine." It may safely be said that, since it is discretionary with the Commissioner, the lists will be confined to the Collectors' offices. The final enactment in its practical operation seems likely to prove distasteful only to taxpayers with smaller incomes.

The House provisions on the automobile excise taxes were accepted, to go into effect on Jan. 1, 1924. They provide (Section 600) that truck chassis and automobile wagon chassis sold or leased for an amount in excess of $1,000, and bodies sold or leased for an amount in excess of $200 shall bear a tax of 3 per cent, all other chassis and bodies 5 per cent, and all parts and accessories 2½ per cent. The offensive of the industry directed particularly at the duplicating parts and accessories tax was ineffective save to reduce it from 5 per cent to 2½ per cent.

Corporation Taxes Remain the Same

With the striking out of the Jones Amendment there was restored the time-worn capital stock tax of $1 per $1,000 of corporate capital, so that taxation upon corporations remains the same as in the old bill.

The conferees approved the inclusion of the Treasury proposal limiting capital losses to 12½ per cent (Section 208) as in the case of capital gains, and the formation of a Board of Tax Appeals to act in public as a court. Contrary to the draft of the Treasury, the court will sit in the open and publish all of its decisions. While, in a sense, this procedure may prove undesirable to many, the fact that it will do away with the present unpublished rulings and other star chamber decisions available only to the Bureau and will make the rulings public to all concerned in similar cases, will go a long way toward making the tax more equitable.

Among the other important revisions of the act is the ungainly increase in estate taxes to a maximum of 40 per cent upon the net estate. The measure can bring little additional revenue to the Federal Government, but it represents so serious an infringement upon the income from inheritance taxes to the various States that the political subdivisions will be forced to seek return from other sources; either from an increased tax upon land or a corporate income tax.

40 Per Cent Gift Tax

The "gift tax" (Section 319) imposing a penalty up to 40 per cent upon benefactions save those for charitable or public use, presents a radical departure from previous assessments. Its enforcement appears impractical and its avoidance relatively simple.

A number of minor miscellaneous taxes, which had inconsiderable bearing upon revenue but were decidedly in the nature of nuisance, were stricken out.

In the interest of clarity and simplicity, as well as in an attempt to eliminate methods of avoidance, practically the entire act has been rewritten in its final make-up. The bill is a safe step in advance of the old act.

In the face of conflicting estimates by the various conferees and actuaries as to the probable result of the act upon the revenue of the Treasury, little can be said at present. In the appreciation that there is still before Congress impending legislation involving expenditures of considerable size, it seems hardly reasonable that the expected surplus at the end of 1925 will materialize. In all probability we will find the next Congress faced with the serious business of providing the required revenue instead of dissipating a surplus.

WORK is to be started shortly on a new Edinburgh-Glasgow road which will comprise two 30-ft. carriage ways, two 10-ft. paths and a 40-ft. space in the center for trolley lines. The cost of the project is estimated at about $8,000,000.

122 cu. in. Engines Make Brilliant Record at Indianapolis

Show dependability and endurance. Only one of the starters out in the first two hundred miles. Duesenberg, first American car equipped with supercharger, wins.

By Sam Shelton

BEFORE the largest crowd in the history of automobile racing all records for the Indianapolis Speedway were shattered when Joe Boyer drove a Duesenberg Special to victory at an average speed of 98.24 miles per hour in the twelfth International Sweepstakes 500-mile contest.

The fastest time ever made before on the Indianapolis track for 500 miles was 94.48 miles per hour in 1922. But this year the perfected 122 cu. in. racing cars not only thrilled the ardent admirers of motor car racing with a new record for the average mileage, but surprised them by setting a pace that rolled the first five over the finish line at greater speeds than the old record of 94.48 m.p.h.

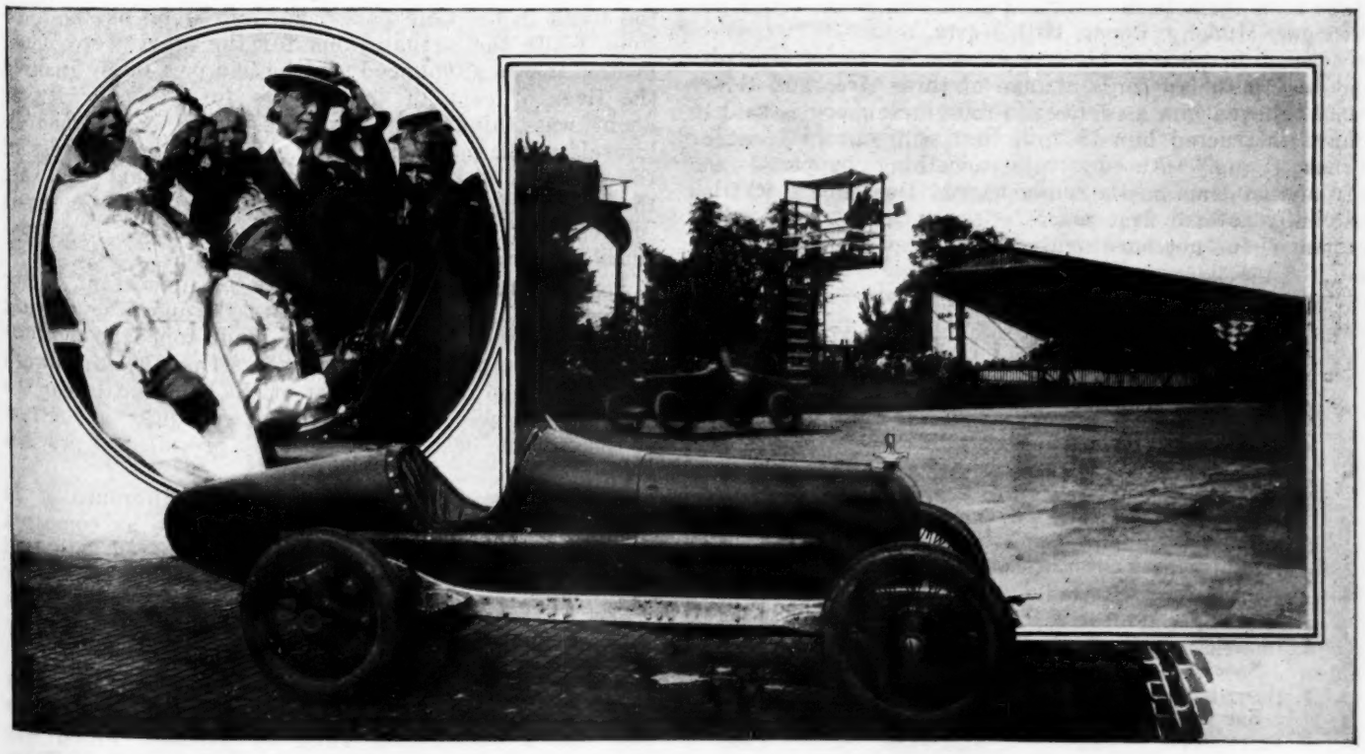
The outcome of this year's race was especially brilliant as compared with last year, when the prize money was taken with an average of only 90.95 m.p.h. for the winner, Tommy Milton, in an H. C. S. Special.

Sharing the glory of today's victory with Joe Boyer is L. L. Corum, who drove the victorious Duesenberg the first 109 laps of its whirlwind course and by his steady work kept it within striking distance of first place. And of course Fred Duesenberg, designer and builder of this car, the first American racing car to be equipped with a supercharger, comes in for his share of the honor attending the hard-earned victory.

Keen Competition for Duesenbergs

But the Duesenberg victory was not a walkaway. It was the bitterly contested, fluctuating, tense, dogged, persistent, thrilling thing that the lovers of automobile racing like to see, with fortune frowning and then smiling upon one or another of the little demons of velocity.

It was not until near the end of the race that the Duesenberg car No. 15 with Boyer driving grabbed the lead. Up to that time the Duesenberg record, with four entries, had been first brilliant, then dissapointing, then determined, but not especially hopeful. Boyer started the race driving the Duesenberg entry No. 9, a car that had qualified at 104 m.p.h. and which was the pet of the



Corum congratulating Boyer. At extreme right is Fred Duesenberg, builder of the winning car

Boyer finishing gets the checkered flag as sign of victory

View of winning car

master designer himself. Like a flash of light, a rush of wind, this car jumped to the front in the first lap and completed the first circuit with its tail fanning a breeze for the nimble Jimmy Murphy in his Miller Special.

It was a start such as Indianapolis had never before witnessed and the stands went wild with the joy of it—and the whisper passed, "It's the supercharger." And it was the supercharger. In this great burst of speed Joe Boyer had the misfortune to shear a key in one of the supercharger gears and this little secret booster of speed was put out of commission. Thereafter Duesenberg No. 9 trailed until, near the end of the race, it was put out of commission by being driven into the retaining wall by a driver who had relieved Boyer.

Murphy in Lead for Some Time

With Boyer's car out of the way and the driver himself dropped from the scene for the time, Jimmy Murphy found it fairly easy to keep the lead, but somehow he couldn't get very far in front of the little green Studebaker Special which had Earl Cooper for its pilot. Lap after lap the two and a half mile circuit was made with Murphy leading, Cooper second and Bennett Hill third in a Miller Special, and less than a minute separated the first from the third.

Somewhere near 140 miles one of the most beautiful speed bursts of the race was seen when Cooper, who had been drawing closer to Murphy, chased him down the stretch in front of the grand stands and nosed in front of him as they passed the starter's stand. On the next lap, however, Murphy regained his lead but held it for only one time around. During all this time Cooper, Murphy and Hill were the leaders, with positions shifting occasionally. Corum in the Duesenberg Special No. 15 was holding pretty consistently to fourth place, but not attracting much notice.

Cooper's first stop was made at his 104th lap and this allowed Murphy to go ahead, but not for long. Cooper was soon again in the lead and at 325 miles the order was Cooper, Murphy, Boyer, Hill, Hartz.

Corum had driven his Duesenberg No. 15 into the pits at his 109th lap for a change of three tires and Boyer had relieved him as driver. Fred Duesenberg is said to have instructed him to "put that ship out in front or burn it up." At any rate something happened and from that time on the supercharged Duesenberg whirled steadily toward first place. Good fortune, too, smiled upon it, for not once again did it stop until the crown of victory had been won. And with it a purse of some twenty thousand useful dollars.

The turn of what looked like an ill trick of fate against the Duesenbergs into smashing and startling victory brought enthusiastic applause from the throngs, but in it was a note of regret that the one to suffer had to be plucky Earl Cooper whose driving was perfect and whose car lacked nothing in speed. Toward the end of the race when he still had a chance to win Cooper had to make two stops for tire changes and although the time consumed in the changes was probably less than 30 seconds it was a serious setback at that critical stage when half a minute would shoot a car more than a third of the way around the track.

The sustained speed of the winning cars was the marvel of the race. The first five cars to finish made average speeds better than the previous track record of 94.48. Cooper's Studebaker Special which finished second with him at the wheel made an average of 97.99 m.p.h. Murphy's Miller Special came in at 97.27 m.p.h. for third place. Harry Hartz in a Durant Special finished fourth at 96.55 m.p.h. and Bennett Hill in a Miller Special was fifth at 96.46 m.p.h.

The sixth car to finish which was Duesenberg No. 12, without a supercharger, was just a shade under the track record with an average of 94.30 m.p.h.

Another remarkable feature of the race was the fact that out of the 22 starters only five were eliminated before the finish of the race. Up to 200 miles only one had been eliminated. This was taken to indicate the great progress that has been made in building dependability and durability into racing cars—an accomplishment from which very valuable lessons have been learned for application to the commercial production of motor vehicles.

Henry Ford Acts as Referee

Interest in the race was lent by the presence of Henry Ford as referee. The Detroit manufacturer rode around the track in the Cole pacemaker and stood on the sidelines while the preparations for the start were being made. It was announced that he had personally insured the lives of each of the drivers for $10,000. He no doubt was thinking of less prosperous days when he himself participated in racing. During the progress of the race he issued a statement saying that the vast throng in attendance proved that every human being is interested in the motor car, and praising the progress that has been made toward its perfection.

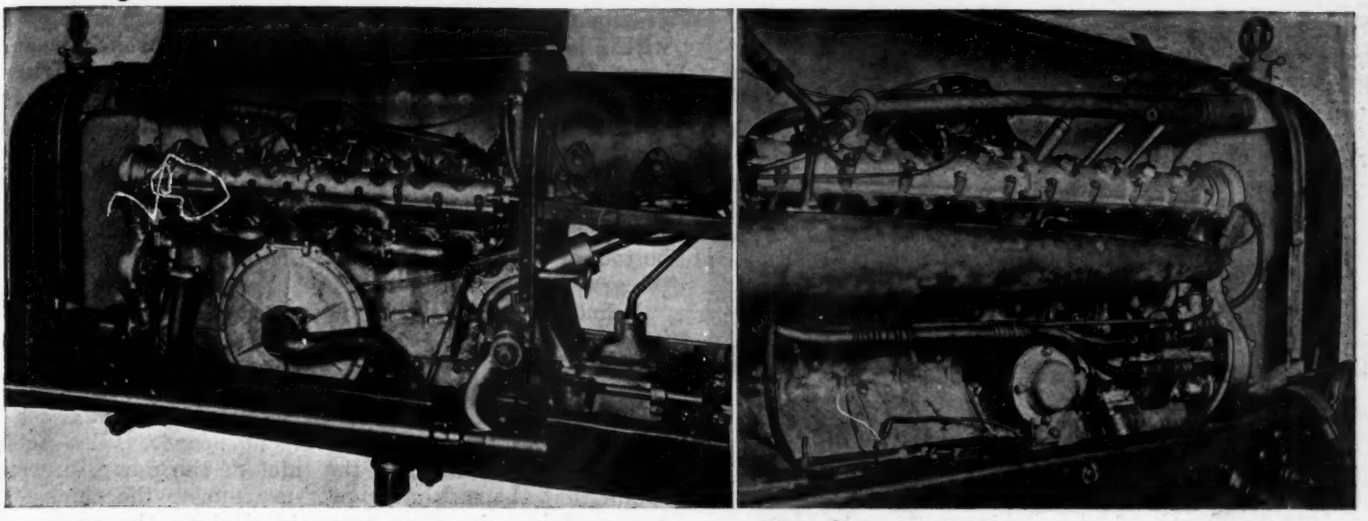
Ideal weather conditions were an important factor in the race. After a day of rain the morning dawned clear and cool. A brisk breeze made topcoats comfortable in the stands. Light clouds overcast the sun toward noon and keep it hidden most of the time until near the end of the race. This condition was quite a contrast to the extreme heat that has usually prevailed at previous races.

The high speed this year made a difference of 24 minutes in the running time of the race as compared with last year and of 12 minutes as compared with 1922 when the previous record was made. This shortening of the time by nearly a half hour was somewhat of a surprise to the spectators, many of whom could hardly realize that the race was over.

The usual $50,000 in prizes offered by the Speedway management to the first 10 to finish was augmented this year by a consolation fund of $10,000, which was proportioned among the drivers who did not place. There was a lap prize fund of $6,250, the winner of each of the first 125 laps receiving $50. Of the lap prize money Joe Boyer won $50, Cooper $3,400 and Murphy $2,800.

HOW THEY FINISHED

Place	Car	Driver	Time	M.P.H.	Prize Money
1.	Duesenberg Special	Corum-Boyer	5:05:23.51	98.24	$20,050
2.	Studebaker Special	Cooper	5:06:47.18	97.99	13,400
3.	Miller Special	Murphy	5:08:25.39	97.27	7,800
4.	Durant Special	Hartz	5:10:44.49	96.55	3,500
5.	Miller Special	Hill	5:11:00.07	96.46	3,000
6.	Duesenberg Special	De Paola	5:18:08.55	94.30	2,200
7.	Durant Special	Comer	5:21:06.91	93.42	1,800
8.	Vail Special	Vail	5:24:03.07	92.45	1,600
9.	Mourre Special	Mourre	5:26:55.62	91.76	1,500
10.	Miller Special	McDonogh	5:31:26.73	90.51	1,400



Views of the left and right sides of the Duesenberg engine showing respectively the supercharger between the carbureter and inlet manifold and the bevel gear drive for the supercharger which is on opposite side of engine

Reliability Is Outstanding Characteristic of Cars in This Year's Race

All but five of 22 entrants were running at finish. Average total time at pits is only 6.5 min. per car. One year now sufficient to bring new design to front. Duesenberg supercharger proves worth.

By Paul Dumas

FROM a technical viewpoint the running of the 1924 Indianapolis 500 mile race will stand out as a high point in American racing history. Among other things it has brought home three significant facts any one of which are as important as the lessons learned from the first foreign invasion by Peugeot in 1913.

First, this race has shown that only one year of development and competition is required to bring a new design to a very high state of perfection.

Second, the supercharger has brought greater speed with reduced piston displacement.

Third, the performance of the contenders proves that they were not only the fastest built, but also the most reliable array of race cars that ever negotiated 500 miles on the famous Indianapolis speedway.

Of five cars that were not running at the finish three were eliminated by comparatively insignificant mechanical troubles and the other two were put out of the running due to accidents that involved the human element exclusively.

With Harry Miller's fourteen aces and the four cars of the Duesenberg brothers holding the center of the stage, the contest devolved into a hard fought race between the products of the two most active American race car designers.

Fred and August Duesenberg had prepared four cars for the race. Three of these were equipped with superchargers and the fourth carried 8 Miller carbureters but was not supercharger equipped.

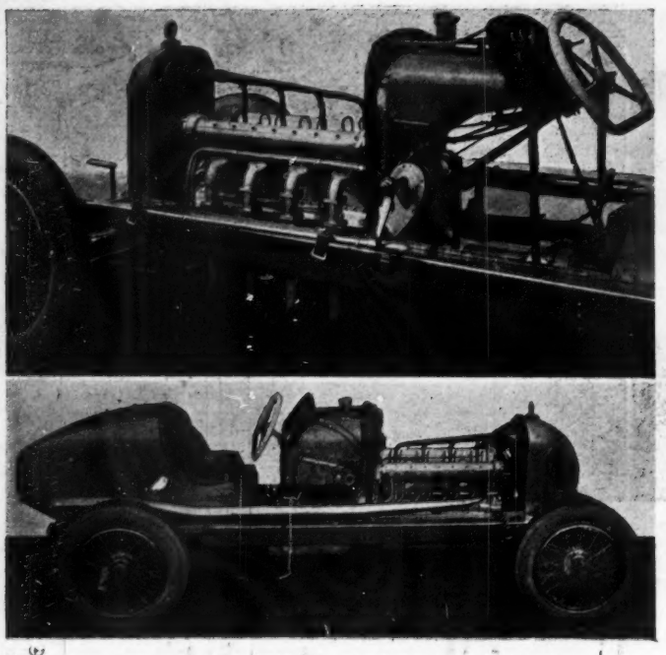
The supercharger layout as used on the Duesenbergs differs considerably from the Mercedes supercharging mechanism. The supercharger blower unit is mounted on the left side of the engine with the plane of the rotor parallel with the center line of the crankshaft. The drive to this unit comes from the opposite side of the engine through a suitable coupling and bevel gear mounting at the end of the water pump shaft. A short shaft passing across the engine between No. 4 and No. 5 cylinders connects the blower unit to a step-up mechanism on the opposite side.

The blower unit is connected in series with the carbureter, being interposed in the distribution circuit between a single 1½ in. Miller carbureter and the inlet manifold. The blower mechanism is of comparatively small dimensions and revolves at approximately 8 times crankshaft speed.

The gas mixture passes through the rotor housing and is considerably agitated by fast moving plates be-

PREVIOUS WINNERS

Year	Car	Driver	M.P.H.
1911	Marmon	Ray Harroun	74.59
1912	National	Joe Dawson	78.7
1913	Peugeot	Jules Goux	76.92
1914	Delage	Rene Thomas	82.47
1915	Mercedes	Ralph De Palma	89.84
1916	Peugeot	Dario Resta	83.26
1919	Peugeot	Howard Wilcox	88.06
1920	Monroe	Gaston Chevrolet	88.50
1921	Frontenac	Tommy Milton	89.62
1922	Murphy Special	Jimmy Murphy	94.48
1923	H.C.S. Special	Tommy Milton	90.95



Above—Front end of one of the Miller-built chassis. Below—Cliff Durant's $25,000 car, which had a longer wheelbase and some other differences as compared to the other Miller products

fore it reaches the inlet manifold. A double step-up drive is used to secure the proper speed ratio for the turbo-rotor. At an engine speed of 2,500 r.p.m. the rotor of the compressor is revolving at 20,000 r.p.m. A pressure of 96 in. of water is exerted by the supercharger at the point of highest efficiency. The entire supercharger and carbureter layout weighs about 8 lb. less than the eight carbureters with manifold formerly used.

With this device the engines are capable of 5200 r.p.m. and have a track speed of approximately 12 m.p.h. faster than the non-supercharger equipped models of last year.

As the design of the supercharger has entailed considerable experimental work and as it is not at present fully covered by patents details of the construction are not available for publication. The photographs shown herewith of the supercharger are exclusive for Class Journal publications.

In addition to the supercharger there are a few refinements incorporated in the Indianapolis Duesenbergs which were approximately as follows:

Cars Nos. 15 and 9 were equipped with two-valve cylinder heads. All cars carried front and rear springs with two less plates than the ones used in 1923, and rubber shock insulators, mounted in cast aluminum brackets of streamline form were used on both ends of rear springs and back ends of front springs.

Millers Cars—Refined 1923 Designs

Two of the cars were equipped with air pressure for fuel feed. The contour of the bodies, especially the shape of the tail, was changed so as to afford a better streamline section. All of the Duesenberg bodies carried gasoline tanks of 40 gal. capacity, and the bodies were finished in Duco paint. The color scheme was dark wine.

Cars equipped with the Miller eight-in-line engine were similar to those of last year with the exception of certain refinements in material and design.

Probably the most important change in the engine was the substitution of nickel molybdenum steel for the crankshaft in preference to the chrome vanadium of previous years. The 1923 Miller engines were equipped with a ball bearing for the No. 5 main crankshaft bearing. The 1924 engines, like the '23's are five-bearing jobs; had all five main bearings of the plain bronze-backed type.

The crankcase oil sump is enlarged as compared to last year and is equipped with longitudinal cooling fins. The oil tank on the new models carries a cast aluminum strainer assembly. This strainer assembly acts as the bottom of the oil tank and like the oil sump is fitted with integral cooling fins.

Refinements affecting the chassis and powerplant included oil pressure gages with a higher maximum graduation than those of last year.

In connection with these gages the orifice of the oil force pump inlet is variable by means of a manual control operated from the instrument board. With cold oil and a set opening on the inlet of the pump, it was found that the maximum pressure due to the thick oil was sufficient in some cases to destroy the pressure gage. To overcome this Mr. Miller installed the higher reading gages and provided means for controlling the amount of oil entering the pump. A manual control operating the air pressure relief valve also is incorporated in the latest model of the Miller jobs.

Tungsten valves were fitted to all of the Miller engines which raced at Indianapolis this year. The valve timing is the same as last year and is quite conventional. The inlet opens at top center and closes 40 deg. past top center. Exhaust valve opens 45 deg. before lower center and closes 7 deg. after top center.

Although not shown in the specifications, Cliff Durant's car differs from the other Miller products in that it is equipped with a four-speed gearset. The wheelbase on Durant's car is 104 in. as compared to 100 in. for the other cars of the same make.

Metal Brake Lining in Miller Cars

Other details of the Miller engine jobs are the use of all metal brake lining. The lining for front and rear wheel brakes is a composition of lead and copper, riveted onto conventional shoes in segments about 2½ in. long.

Miller built cars carried 29 x 4½ in. tires front and 30 x 5 in. rear, a Miller four-plate clutch, and a Miller three speed gearset, built in unit with the engine were employed. Drive from the end of gearset shaft is through a Thermoid fabric joint. The rear axle is of Miller design and manufacture, incorporating machine steel housing bolted to an aluminum alloy differential housing assembly. The type is three-quarter floating. At the front end of the torque tube is a spherical housing of approximately 8 in. diameter. This housing serves to take propulsion and torque. Brake drums front and rear are 12 in. diameter by 15/16 in. wide.

The front axle of all the Miller engine cars is of the tubular type and chrome vanadium with forged and machined knuckles electrically welded at the ends. For retaining front springs, studs are riveted into the axle seats and the conventional clip and nut is used.

The steering gear is of Miller manufacture and of the worm and wheel type. The number of revolutions of the steering wheel from extreme locked to locked position of the road wheels is approximately 1¾ turns. The turning arc is 30 deg.

Front springs are of the half-elliptic type shackled at the rear and are 30½ in. long by 1¾ in. wide. The rear springs are 37½ in. long. Firestone rims mounted on Rudge-Whitworth wheels are used.

Engine specifications are as follows:

Eight cylinders, 2.3334 x 3.5 in., giving a piston dis-

placement of 120.8 cu. in. The brake horse power said to be 120 at 5000 r.p.m. Compression ratio is given as 7.25 to 1. Cylinders are cast in two blocks with solid head and are machined all over.

There are two valves of 1 3/16 diameter per cylinder. The crankcase is of aluminum alloy barrel type. Two camshafts driven by a train of seven spur gears actuate the valves which are placed at an angle in the head. The valve action is exactly similar to that used last year, incorporating a thin-walled cup riding in an aluminum housing. The side thrust of the cam is taken by the cup and transmitted to the walls of the aluminum camshaft housing. Adjustments for tappet clearance are made by grinding the end of the valve stems.

Chrome Vanadium Rods in Miller Engines

Pistons are of aluminum alloy, are Miller made and are 2⅛ in. in length over all with a construction height of 1 3/16 in. There are two rings mounted on top which are of 3/32 in. wide. The third ring is ⅛ in. wide and is a perfect circle. Piston pins are 2⅛ in. long, by 1/16 in. wall thickness by ⅝ in. diameter and float in rod and piston. The tubular connecting rods are of chrome vanadium steel and measure 7 in. center to center.

Four carbureters of a nominal throat size of 1½ in. were used on some Miller engines, but others were equipped with eight carbureters of the same size. Ignition is by special Delco distributor driven at camshaft speed.

It is certain that additional supercharged jobs will be seen on the track next year and possibly on the board tracks before the end of this season. Harry Miller states that he will put several supercharged jobs on the tracks before the end of the California racing season. It is also rumored that he has in preparation a 91-cu. in. racing car which possibly may be seen in competition at Indianapolis next year.

Seventy-two stops at the pits consumed a total of 141 min. of the racer's time. This is a remarkably good showing and probably a record for races of this kind. It represents an average of only 6.5 min. for each car in the race and accounts largely for the fact that the winners finished so closely.

Short as the stops were, they had, in some instances a material bearing on the results. When Earl Cooper was in second place on the 178th lap, he was only 25 sec. behind Boyer, the leader, and was catching up to him at the rate of two sec. per lap. At that rate it would have been a "neck and neck" finish, but two tire failures in rapid succession put Cooper too far back to hope to win.

The winner stopped but once, that being for tires, gasoline and oil. Earl Cooper who finished second, stopped three times, totaling 2 min. and 33 sec. The winning car stopped for 40 sec. This is a difference in time at the pits of 1 min. 53 sec. As the winner led at the finish by 1 min. 22 sec., it is evident that the stops at the pits just about decided the race.

Two unusual features were prominent in the pit stops this year. These were the effects of the rough track on those who had not properly designed the spring suspension to meet this difficulty and leaky gasoline tanks. There were ten stops for the latter reason. Five stops were made to adjust shock absorbers and relief drivers on some of the cars were called for repeatedly.

Three cars went out of the race on account of leaky gasoline tanks. These were Hearne's Durant Special, Milton's Miller Special and Frank Elliott's Miller Special. The rough track is blamed for the trouble. Spring deflections were greater than expected causing the rear axle to hammer the gasoline feed tank.

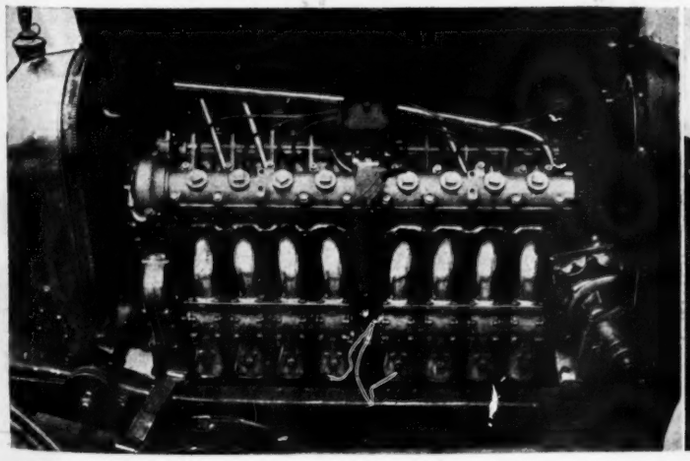
Joe Boyer in his Duesenberg Special who had stepped out and won the first lap was the first to pull up to the pit. Just after completing his second lap he started to slow down and stopped at his pit on his next lap. As a result of his rapid acceleration he sheared the key which drives the supercharger from the oil pump driveshaft. He continued without the supercharger. The stop lasted 50 sec. He had also lost the gasoline tank cap which was replaced on his next lap in 7 sec.

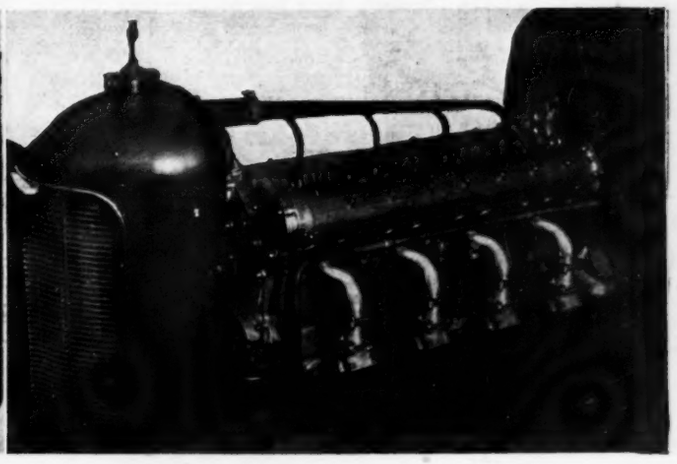
Some Drivers Narrowly Escape Accident

A broken steering knuckle caused E. Ansterberg in his Duesenberg Special to collide with the pit wall just before entering the back stretch on the second lap. The driver was unhurt except for a slightly scratched nose, but the car was out of the race. Ansterberg returned to the pit and was held in readiness to act as relief driver.

Jimmy Murphy blew a left rear tire on his 146th lap and had a narrow escape, as he turned around twice when he did it. He straightened out his car, however, and came into the pit where he made his tire change in 17 3/5 sec.

Hard luck overtook Earl Cooper as he was making a fine bid for first place, less than 26 sec. behind the leader. He had to come in on the 178th lap for a right rear, the change being made in 18 sec. Four laps later he came in again for a right front, changed in 15 sec. These stops cost his chance for the race.





Left—De Paolo's was the only Duesenberg chassis which was not fitted with a supercharged engine. Right—Miller engine in Tommy Milton's car which is credited with making the fastest mile ever made with a car having an engine of less than 122 cu. in. capacity

International Bus Has Four-Wheel Air-Operated Brakes

Chassis adapted for thirty-passenger bodies, is furnished in three different gear ratios, and has ball bearing removable cylinder sleeve engine and an internal gear final drive.

A NEW 30-passenger bus chassis suitable for both urban and suburban services is now in production by the International Harvester Co. at its Akron, Ohio, plant. It has a four-cylinder powerplant and a load capacity of 5000 lb. The speed range with 36 by 6-in. pneumatic tires is up to 35.5 m.p.h. with a 7 to 1 gear ratio, and 27.5 m.p.h. with a 9 to 1 ratio. The wheelbase is 190 in. Several different types of body have been mounted on this chassis, including a center aisle type and a six-door side entrance design with continuous transverse seats.

The engine is the International block cast 4¼ by 5-in. four-cylinder unit with removable cylinder sleeves and ball bearing crankshaft. The two front bearings are of 2¾-in. bore, 5 29/32-in. outside diameter and 1⅜-in. width, the corresponding dimensions of the rear bearing being 3 9/64, 6 11/16 and 1 17/32 in. The connecting rod bearings are babbitt-lined and bronze-backed; they are 2⅝ in. in diameter and 2¾ in, long. The rods are bushed with phosphor bronze at the small end.

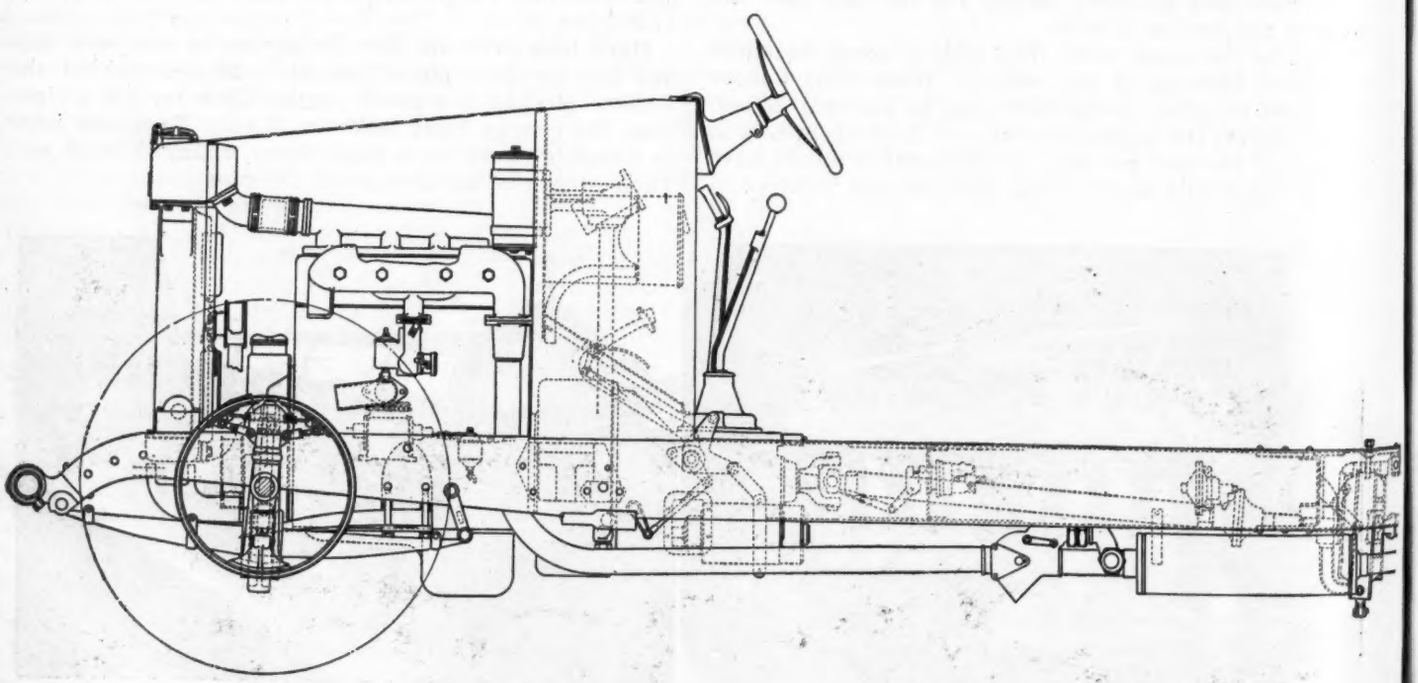
Lubrication is by combined splash and pressure feed, ignition by the Remy battery system and the carbureter is the 1¼-in. vertical International. The overhead valve mechanism is entirely inclosed. If desired, a fly-ball type governor will be fitted to hold the speed down to 16 m.p.h. The engine is supported at three points on the main frame.

The drive is through a multiple dry disk clutch to a four-speed gearset mounted as a unit with the engine. This has direct drive on third speed and an over drive on fourth. The gear reductions are: Fourth, 0.627 to 1; third, direct; second, 1.7 to 1; first, 3.12 to 1; reverse, 3.75 to 1. Behind the gearbox there is a hollow propeller shaft with a universal at each end. The shaft is broken at the center of its length where the brake is located, which is supported by a chassis cross member.

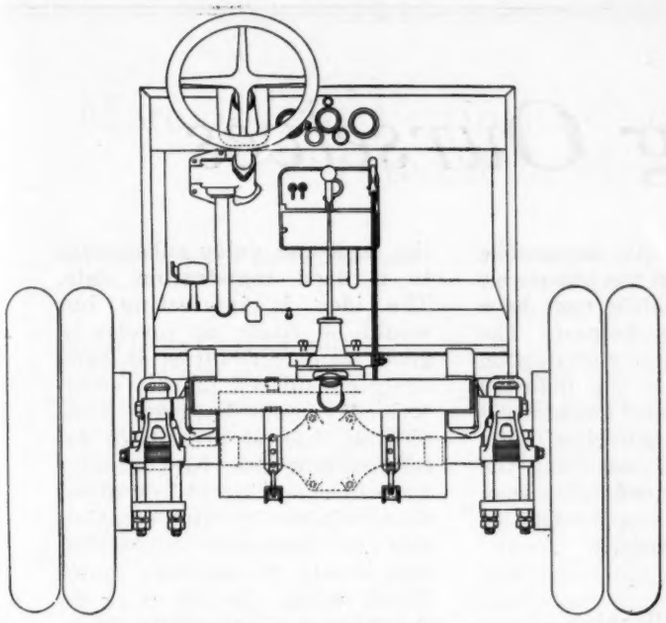
The rear axle is an International design with internal gear drive. The carrying member is a round section drop forging with annular ball bearings for the wheels. Three ratios are supplied, 7, 8 and 9 to 1. The front axle is an I-beam section with Elliott type, heat-treated nickel steel knuckles. The tie rod is a ball and socket design. The front wheels are carried on taper roller bearings. The spring suspension is semi-elliptic with cantilever auxiliary springs. The front springs are 41¼ by 2½ in.; the rear, 56¾ by 3 in., the latter being underslung from the rear axle. The cantilever auxiliary springs are 20¼ by 2 in. at the front and 34½ by 2½ in. at the rear.

Service Brakes Are Internal Expanding

The service brakes are internal expanding and are operated by air pressure controlled by pedal. The contracting type emergency brake is hand operated and is mounted on the propeller shaft. The total braking area is 660 sq. in. The wheels are demountable disk, with



Side view of the International Harvester Co. Model 53 bus chassis showing arrangement of four-cylinder



Showing the rear view of International bus chassis

36 by 6-in. single tires in front and 36 by 6-in. dual in the rear.

The overall length of the chassis is 275½ in.; the distance from the cowl to the end of the frame, 205¾ in., and the overhang behind the rear axle, 54⅝ in. The outside width of the frame is 34 in.; the height of the frame at the door with normal load, 24 in., and the road clearance, 7⅛ in. under the front axle and 12⅝ in. under the rear axle.

The turning circle is 70 ft. The equipment regularly furnished with the chassis includes a front bumper, electric head and tail lights with generator mounted on gearset, electric starter, horn, clock, oil gage, gasoline gage, speedometer, automatic windshield cleaner and self-contained switch panel.

French Automobile Exports Show Considerable Decline

WHILE showing the substantial total of 4063 passenger cars, valued at 118,083,000 francs, and 450 trucks with a value of 11,335,000 francs, French automobile exports for the month of March show a falling off of 12 per cent compared with the month of February. Compared with March, 1923, the increase is 113 per cent on the number of passenger cars. The decreased volume of business for March, compared with February of this year, is most pronounced for the Belgium-Luxemburg Union and for Germany, the drop being smaller for Great Britain and all other countries.

During the month of March France imported 384 automobiles, of which 257 came from the United States and 118 from Italy, compared with a total of 1580 for the month of March, 1923. Truck imports totaled only three for the month.

The big export business to Germany, which was a pronounced feature of the opening month of the year, has come practically to an end and it is expected that April figures will show that very few exports have been made to this country. England's recent decision to admit automobiles free from the month of August are expected to be beneficial to the French industry, but it is believed that the immediate result will be a distinct slackening off of business, for clients are holding off buying until August in anticipation of a drop in prices.

As the active buying season will then have come to a close and the annual shows will be approaching, French makers do not look for largely increased sales in England until 1925. Last year France shipped 6992 passenger cars and 246 trucks with a value of 164,000,000 francs to Great Britain. This represented about one-fourth of the total French exports.

A Country Which Uses Very Few Accessories

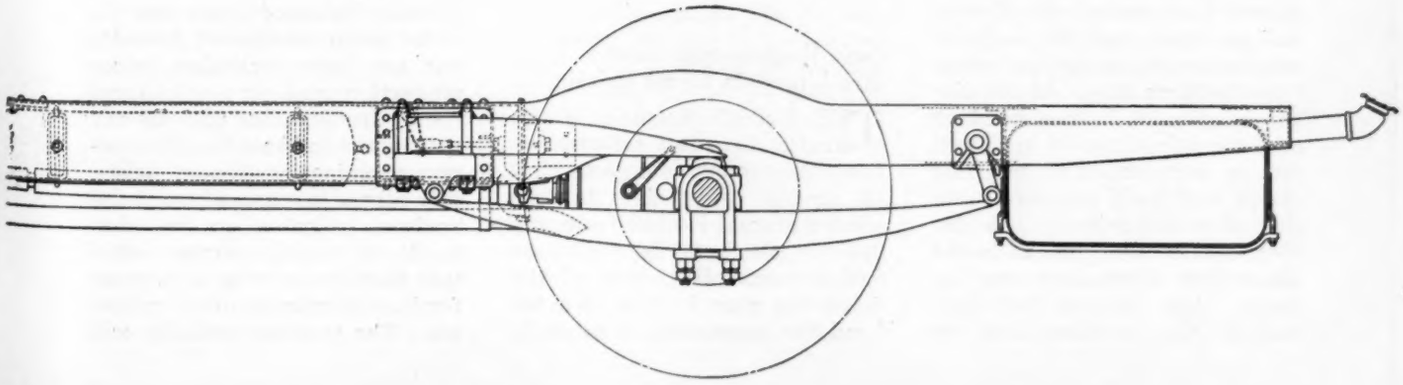
YUGOSLAVIA, with its population of 11,500,000 and 88,000 square miles of territory, is a country practically without cars equipped with bumpers. Shock absorbers, mirrors, windshield wings and the like are unknown save as they are imported as stock equipment, and the sale of storage batteries will not exceed 100 a year.

Dealers in machinery handle bearings and brake and transmission linings. Carbureters are rarely ever replaced and tire chains generally are made to order locally.

Hoists for garages and wrecking cars, garage jacks, load meters and hand and electric valve grinders do not exist. Fan belts are replaced by leather belts from local markets, while electric light bulbs are secured almost entirely from Germany together with magnetos and spark plugs in millimeter sizes.

Stocks of European producers can be secured on consignment or long credit terms and the difference in time of delivery, cost of freight, insurance and conditions of payment constitute a serious handicap against the sale of American manufacturers.

While Yugoslavia has several ports of its own, a great majority of its imports are made through Saloniki. German is the language used.



with internal drive rear axle and air service brakespowerplant and drive units. This chassis is fitted

Just Among Ourselves

Greater Speed Increases Carrying Capacity of Highways

TRAFFIC congestion is caused by lack of speed just as much as by narrow roads, according to some students of the subject. Tie-ups at cross roads will cause congestion even of roads of considerable width, while speed limits which prevent cars from traveling above a snails' pace decrease motor vehicle efficiency materially. An old record unearthed by the Pennsylvania Department of Highways gives an interesting sidelight on this question. This record shows that the Lincoln Highway had a traffic problem way back in 1830. While the road was narrower at that time than at present, the traffic was much lighter. But it consisted chiefly of broad wheel wagons, draft horses, riding horses, and cattle teams, most of which moved very slowly. The record shows that more vehicles now pass over the Lincoln Highway in one week than in the entire year of 1830. While the width of the road is greater today, it is not nearly so great in proportion to the volume of traffic which it carries. Increased speed has increased carrying capacity.

Production Methods Used In After-Dinner Speeches

ALFRED REEVES introduced an innovation at the Cleveland dinner of the American Trade Association Executives which should meet with heartfelt praise from business diners all over the country. Mr. Reeves has presided over this body of men representing various industries for some time. At the dinner in question he had lined up an imposing array of speakers, ten in number. The program stated that each one was to be limited to five minutes. So far there was nothing unique in the idea. But then came the big event. Mr. Reeves not only started the speakers but he stopped them! An automobile man has achieved the impossible again as automobile men have done so often in the past. The principles of quantity production which have made the industry famous were applied successfully to after dinner speeches. The beauty of it all was that the quality was improved rather than decreased by this application of time study methods.

British Makers Planning To Increase Overseas Sales

WHILE the first World Motor Transport Congress was being held in the United States, the United Kingdom was conducting a British Empire Exhibition, an important feature of which was the display of British automotive products and the attempt to sell the British people on the prominence of British cars in foreign lands. Despite the optimism of the English concerning their motor car export trade, the fact remains the American vehicles overwhelmingly predominate in practically every world market today. The significance of the great enthusiasm being shown about the automotive section of the British Empire Exhibition lies in its indication of the strenuous efforts for overseas trade that English car and truck builders are going to make in the near future. American manufacturers have nothing to fear from this activity at present but constructive work must be continued to hold the markets which already are ours.

New Registration Laws Are Urged in Great Britain

THE British journal, *Motor*, urging taxation reforms on the Government, suggests that "it should be possible to take out an annual license from any date in the year to expire on the corresponding date of the following year." The idea behind the suggestion is to avoid the rush and delay subsequent to a fixed registration date. The idea is interesting but would be likely to involve a good many difficulties if seriously considered in this country. It would be even more difficult than at present to determine how many cars actually were in operation at any given time. Collection and compilation of necessary marketing data would be hindered materially, while clerical work in the various State offices probably would be increased.

Eight Cylinders or Six, That Is the Question

IT is hard to tell what type of engine ultimately will meet the engineering and sales requirements of the automobile industry. In days gone by the "one-lunger" furnished joy and exasperation to enthusiastic experimenters. Then it was displaced by the high-powered two-cylinder job. In recent years the four and the six have held the center of the stage, with scattering eights and twelves in the numerical background. For a time some people worked on the theory that if two cylinders were better than one and four better than two, the value of the powerplant was certain to increase directly in proportion to the number of cylinders added. The passing out of the twelves, however, indicate that this theory may not be entirely true. Some engineers believe that since the six-cylinder engine can be inherently balanced there are no sound technical reasons for adding any more cylinders, since production and service charges simply are increased without any compensating benefits. The current prominence of new eights, with others just appearing on the horizon, indicates, on the other hand, an equally strong belief that there are very good reasons for having more than six cylinders. The question probably will

More or Less Pertinent Comment on Topics of Current Interest to Men in the Industry

not be answered finally for some years.

Runabouts Coming Into Greater Popularity Again

RUNABOUTS are gaining in popularity again after several years of comparative obscurity. Several big factories report that they are unable to meet the demand that has sprung up for this type of car. Sales-managers are casting about for an explanation of this rejuvenation of the two-seater. One close observer lays it to the fact that the automobile has ceased to be a curiosity and that automobile riding no longer is a novelty. People are buying to fill their own needs today, instead of planning to take their neighbors with them whenever they go out. Most of their neighbors, moreover, have a car of their own. Old John Pessimist allows as how the trend is caused by the fact that the only way you can keep your wife's relatives from horning in on your party is to reduce the seating capacity.

Paths of Glory Often Lead but to the Museum

THE Ace Motorcycle Corp., which constructed the fastest motorcycle ever ridden, was sold at auction a short time ago. The present owner of the famous Ace, which made a speed of 129.61 m.p.h., is unknown, according to *Motorcycling*. It is stated on good authority, however, that the machine will never be ridden in competition and that it some day may revert to C. W. Plass, receiver, at which time it will be placed in a glass case and presented to a museum. Perhaps the fate of this speed marvel will be symbolic. If all motorcycle racing machines were in a museum the industry might be able to concentrate better on constructive merchandising and less on dare-devil driving. Racing has contributed materially to both automobile and motorcycle progress, but in the latter case it has overshadowed more important activities.

A Rose by Any Other Name Is Just as Sweet

"PIRATE part" is one of the most widely used and most loosely defined terms in the automotive business. The word "pirate" has an unpleasant connotation which has been applied too frequently to perfectly legitimate commercial enterprises. Some car manufacturers have called "pirate" all parts which they do not manufacture themselves or which do not pass through their hands on the way to the dealer. Still, prominent parts makers, who sell original equipment to many responsible car builders, find a wide and highly profitable market in selling to dealers units specially designed to replace those used as original equipment on the largest selling passenger car in the world. They do not make original equipment for this car, but certainly there is no reason to brand them with a name implying that they are robbers. There is no logic in using the term pirate to describe any manufacturer who makes a part of good quality, trade-marks it, and stands behind it with his reputation and service.

Spirit of Gift Takes Place of Gift of Spirits

EDWARD S. JORDAN was the recipient of special compliment from one of the foreign delegates at the World Motor Transport Congress in Detroit. As he was leaving the platform after making his talk on effective advertising, Mr. Jordan was approached by G. N. Penso of Jamaica who handed him an attractive looking cigar with the remark: "I am sorry, Mr. Jordan, that I cannot give you a bottle of good Jamaica rum, but I can give you a good Jamaica cigar."

An Old Job Approached From a Fresh Point of View

WALTER P. Chrysler has evolved a constructive publicity stunt which should achieve its purpose of making his already illustrious name more familiar to the public at large as well as help solve a troublesome automotive problem. Through his advertising agents, he is syndicating a series of "Traffic Talks" to various newspapers throughout the country. While the material is being furnished free of charge, the editors are urged to accept or reject it purely on its merits as a feature of interest to their readers. The first batch of "talks" contain much worthwhile material and should find a reasonably good market. The idea of this series seems to be born of the sound theory that the best way to get your name before people is to say something that will interest them. Would that all publicity were conceived of a like sire!

Special Studies by Individual Executives Useful

OTHER executives in the past have specialized on specific topics so that they have come to be known as authorities and thus have contributed greatly to the progress of automotive development. The favorable attitude with which the motor industry is viewed by the public at large is due very largely to the vast amount of time spent by prominent executives in analyzing and interpreting problems affecting the industry as a whole. Roy D. Chapin and A. S. Brosseau on highways; Edward S. Jordan on merchandising; A. R. Erskine on finance; John N. Willys on foreign trade; George Graham and Alvan Macauley on traffic; and a host of other names are included in the list of those who have given intensive study to particular questions confronting the industry.

N. G. S.

Motor Vehicles Have Become Allies of Rail and Water Carriers

"The best interests of the public lie in cooperation between the various agencies of transportation, rather than in wasteful competition."

By Sir Henry Worth Thornton
Chairman of the Canadian National Railways.

I HAVE been extremely interested in the development of the motor vehicle industry for several reasons, among which could be mentioned:

1. Its importance as a source of traffic directly and indirectly for our railways.

2. Because it has become such a potent factor in our daily economic life.

3. Because it has appeared on the horizon as an active competitor with our railways for certain classes of business.

Our present economic structure is so complex and the process of evolution apparently so rapid that I consider it a wise policy for us to have a free and open exchange of views to the end that we may fully comprehend all the factors entering into the motor vehicle industry and its relation to the scheme of transportation.

NO small significance attaches to this statement presenting the viewpoint of an important railroad official on motor vehicles and their place in the great systems of transportation.

It behooves those of us who are engaged in the operation and development of other transportation facilities to consider very carefully to what extent, if any, our respective agencies may be supplemented by or developed in cooperation with the motor vehicle, as I agree with the Special Committee No. 4, appointed by the president of the Chamber of Commerce of the United States to inquire into and report upon the "Relation of Highways and Motor Transport to Other Transportation Agencies," when they say "the best interests of the public and the rail, water and motor carriers lie in cooperation between the various agencies of transportation, rather than in wasteful competition."

Railway executives in general, no doubt, have in the past been prone to consider the motor vehicle more as an enemy than an ally, except in so far as that the materials entering into its manufacture and its distribution may have paid transportation charges to their respective railways.

Happily, however, reason has prevailed and an honest attempt is now being made to develop, as far as possible, the economic limitations of the motor vehicle as a transportation facility, with a view of assigning it to its proper place in our general transportation structure.

In considering the question of the adjustment of the motor vehicle to most effectively meet railway requirements, it is necessary to have accurate data as to its physical limitations and as to the cost of operation and maintenance, including the contribution now made, or which should be made by it, toward the maintenance of highways.

Fairly reliable information is available regarding cost of operation of motor vehicles in passenger service, because this service has become highly organized and statistics in regard thereto have been maintained over a considerable period of time.

The same cannot be said, however, in regard to the motor truck, and it is very doubtful indeed if any very conclusive data are yet available in regard to the contribution which motor trucks should be called upon to make, in order that they bear their proper proportion of the maintenance of the highways which have to be specially constructed to accommodate such heavy traffic, the capital cost of important highways running from $30,000 to $50,000 per mile.

It must be quite clear that the motor vehicle, so far as it affects the railway, may be considered from two standpoints:

1. As a passenger facility.
2. As a freight facility.

As a passenger facility it, of course, has to be judged by the ordinary standards the public is accustomed to apply to passenger accommodation, namely:

1. Its ability to render regular, comfortable, safe, adequate and satisfactory service as efficiently as possible under all ordinary conditions.
2. The cost of the service.

There does not appear to be any doubt but that the motor vehicle might quite reasonably be expected to fulfill these conditions in regard to a certain limited class of passenger traffic, particularly on branch lines and in large terminals, thereby supplementing the existing railway passenger accommodation and, in some cases, permitting the railways to eliminate altogether or at least reduce the volume of non-remunerative passenger service.

From the standpoint of the transportation of freight, however, adjustment of the motor truck bids fair to develop into a factor of some considerable importance in dealing with certain classes of traffic, for example:

1. The haulage of commodities from the farm to the railroad or water shipping point.
2. In relieving congested terminal conditions.

*Speech delivered at the World Motor Transport Congress.

3. In radial operations from large cities in the delivery of less-than-carload lots of merchandise and raw materials.

4. In the haulage of perishable farm and dairy products, such as milk, fruit, and vegetables.

5. In the operation in short hauls between centers of population, where the truck offers a special degree of service in the carriage of commodities from the consignor to the store door or home of the consignee, where time is an important factor.

6. In longer hauls where rail development has not been sufficiently extensive.

In this connection, I am very pleased to note that a number of the railways of the United States have been carrying on extensive investigations during the last two or three years, with a view to ascertaining to what extent the motor vehicle could be adjusted to meet railway requirements. We, on the Canadian National Railways, are watching these experiments with considerable interest, as we feel we are likely to be faced in the very near future with conditions substantially the same as those at present obtaining in some of the more densely populated sections of the United States.

Store Door Delivery

In Canada, as in England, store door delivery has been adopted as a solution of the problem of the freight house congestion and for a long time carriers have provided in the principal distributing centers a cartage, or a trucking service, between their freight terminals and the warehouses or store doors of the "traders."

The service is operated by the carriers under contracts or agreement with teaming companies acting as their agents. It applies to traffic rates in the Canadian Freight Classification as fifth class or higher, less than carload and carload, with the exception of bulk freight or articles weighing 2000 lb. or over, per piece or package.

Tariffs are issued by the Canadian carriers for the teaming service and are filed with the Regulating Commissions as terminal charges. The rates named in the tariffs apply only in the areas embraced in what is termed cartage limits.

In the territory west of Port Arthur cartage tariffs are not issued by the carriers, although in the principal distributing centers a similar service is provided by the large teaming companies operating in connection with the railways, with the exception that the teaming companies themselves issue rate schedules.

The Question of Way Freight

We have not as yet made any experiments in the way of replacing our existing way freight services by the utilization of the motor truck operating on highways. We have, however, been watching with considerable interest the development along these lines made by private individuals in conjunction with the movement of supplies for limited distances to and from manufacturing plants and by private trucking concerns. We are also utilizing the motor truck in some of our larger terminals for the transfer of l.c.l. freight to and from connections and between freight sheds. This practice has so far proved both satisfactory and economical.

In addition to this, we have been experimenting with various types of self-propelled rail unit cars, largely for passenger and baggage, or express services, to meet one or other of the following conditions:

1. To give a frequent passenger service on sparsely settled branch lines, or parts of main line adjacent to market towns or junction points.

2. To connect junction points, on important main lines, with the town or small city situated within a few miles of the main line.

3. To give a group of towns, situated on a main line or important branch lines, a frequent connecting service over and above through main line trains.

4. To connect small summer resorts, golf clubs, etc., to branch line or through main line service.

5. To handle milk of a limited amount to a distributing or connecting point.

6. To provide connections to small suburbs.

Among the various types of self-propelled rail unit cars has been the so-called motor car, but there is still much to be done before we will be entirely satisfied with our efforts in this connection.

Points To Be Adjusted

In considering the question of the adjustment of motor vehicles to the functions of a common carrier, a great many questions come to mind, among which might be mentioned:

1. The attitude of the public which, so far as the handling of freight is concerned, really resolves itself into a question of the service rendered and the cost of the service, together with the responsibility of the carrier for loss and damage. From the standpoint of the passenger service, however, conditions are somewhat different, as the degree of personal comfort and smooth riding qualities of the steam and electric trains cannot be ordinarily equalled by the motor passenger coach, unless the highway is improved, and this is a factor which has to be taken into consideration.

2. The second query is in connection with the construction and maintenance of highways. It is necessary to have specially built and adequately maintained highways to properly accommodate any large development in the use of the motor truck, and a large body of opinion rather holds the view that the motor truck destroys public highways to a large extent without a corresponding contribution towards their maintenance. Unquestionably, any substantial increase in the use of the motor truck on highways would necessitate the design and maintenance of those highways to adequately meet the traffic requirements.

3. The third point is the extent to which the motor vehicle as a transportation facility should be subjected to public regulation. I think there can be no question that regulation of traffic and of size, weight and speed of motor vehicles by public bodies, having control, should be as uniform as possible and that regulation of common carrier operations of motor vehicles, including rate regulation, should be handled by the same public bodies which now control the operations of rail carriers and that all comparable features should be similarly treated.

4. In any possible substitution of motor vehicles for railway requirements, the question naturally arises as to who shall operate the motor vehicle, that is to say, should the operation be done by the railway organization or by a separate organization? Opinions appear to differ on this point and a good deal may be said for and against. Undoubtedly, there are certain conditions under which it would be more profitable for the railway to operate the motor vehicles itself. On the other hand, there are conditions under which it would be undoubtedly more advantageous to have the motor vehicle operation handled by an outside concern.

Sound Financial Structure Necessary

One thing is certain, however—if motor transport is to be a substantial factor, it must be placed upon a sound financial basis, so as to insure to the public continuity and

reliability of service. Whether this can best be done as a department of the railways, or by a separate and individual organization, working in close conjunction with the railways, I am not prepared to say.

In general I subscribe to the conclusions reached by the Special Committee No. 4 appointed by the president of the Chamber of Commerce of the United States as contained in their report issued in November last.

If any discussion such as this is to be constructive in character, it is essential that conclusions should be thrown into bold relief for the purpose of focussing subsequent argument. Therefore I venture to place before you the following summary of the subject of this paper in the hope that it may furnish a fruitful field for constructive argument:

1. Motor propelled vehicles promise to become economical adjuncts to the services performed by railway companies, both on their own lines and on the highways, and an important and useful field exists for further investigation in this direction.

2. The attitude of the railway companies toward motor transportation as it is generally and broadly known should not be hostile, but an effort should be made to harmonize both with the object of providing to the community a constantly improving transportation service.

3. The constantly increasing volume and weight of motor vehicles traveling upon the highway demands a roadbed of more permanent character and the provision of some form of assessment in some measure proportionate to the use made of the highway.

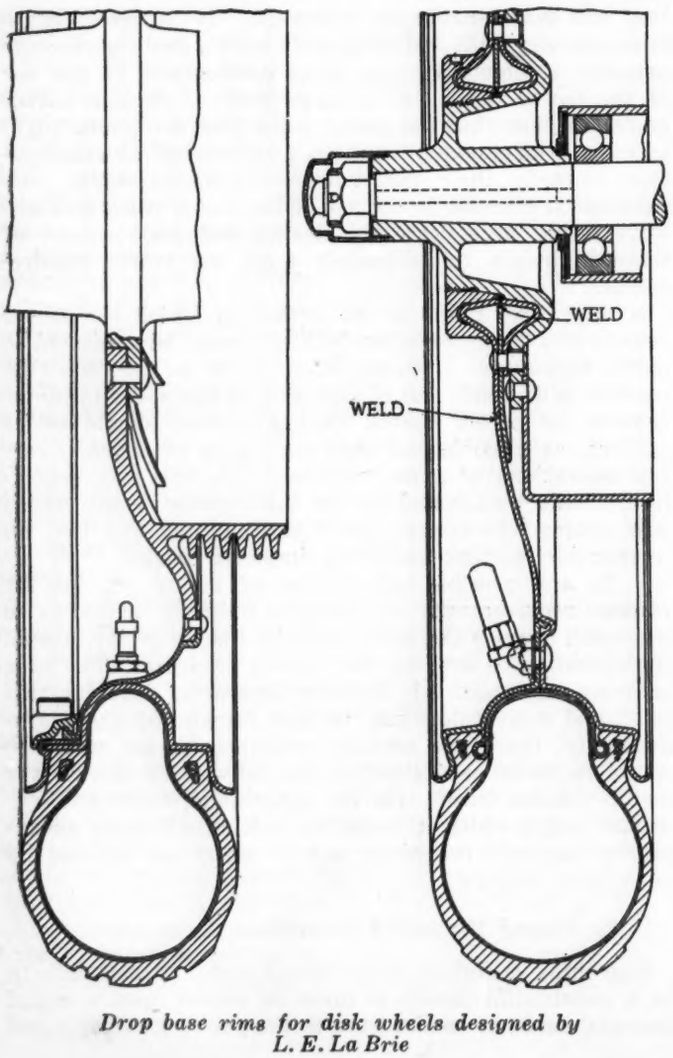
4. Since motor transport is likely to play a constantly increasing part in the welfare and economic life of the community, companies engaged in the industry will sooner or later have to contemplate the same degree of regulation with respect to services and charges as is now imposed upon other common carriers.

Disk Wheel Incorporates Drop-Base Rim

DISK WHEEL, incorporating drop-base rims and other unusual features, have been made the subject of patent applications by L. E. LaBrie of Chicago. Sectional drawings of these wheels are shown in the accompanying cut. Among the claims made for one or both of these designs may be mentioned the following:

Positive locking of the tire to the rim in such a way that it cannot come off as a result of sudden deflation; ability to quickly remove the wheel by removing the nut with V-groove at the hub; ready adaptability of the wheel to manufacture by stamping; rapid conduction of heat away from tire due to intimate contact of tube with rim. Increased resiliency due to increased air space as compared to conventional construction; readily accessible valve, and integral brake drum construction.

Unlike some other drop-base rims, those illustrated herewith are made in more than one piece, while in one case an auxiliary rim is employed to lock the specially formed bead of the tire in place.



Drop base rims for disk wheels designed by L. E. La Brie

AMERICAN railcars have proved a success on the British section of the Kowloon-Hongkong Railway, where they have been in operation since 1922. Leroy Weber, Consul at Hongkong, reports that the railroad officials have found that these railcars have rendered good and economical service and that they meet the requirements for working up new traffic, for development and emergency purposes, and for a light train. The only difficulty has been the delay in securing spare parts and replacements.

Two of the twelve railcars ordered from an American manufacturer arrived and have been installed in South Australia after successful trial trips, according to the Consul at Adelaide, H. H. Balch. He reports that the Chief Commissioner of Railways plans to purchase about 100 additional railcars for passenger service in South Australia during the next two or three years, and adds that there is a possibility of all the States of Australia adopting this type of passenger vehicle for feeder and short lines in less populous territory.

The Tasmanian Government has railcars under consideration, while the New South Wales Government is experimenting with manufacturing in their own shops. It is understood that the cost is prohibitively greater than that of American cars.

According to estimates made by the International Nickel Co., the research bureau of which has made a careful study of the automotive consumption of nickel, the 1923 consumption of nickel by the industry amounted to 7,359,000 lb., as compared with 5,285,000 in 1922, an increase of 2,074,000 lb., or 39 per cent, over the preceding year.

These figures include both the nickel used in alloy steels and the amount used in nickel plating.

Willard Charged Bone Dry Batteries Simple to Ship and Store

Are claimed to prevent all deterioration between shipment and placing in service and to obviate the necessity for charging upon receipt by the customer which formerly has been requisite.

BATTERY storage and shipping, which have presented complicated problems for the car and the battery manufacturer, the dealer and the specialized service station, have been simplified by the introduction of the Willard charged, bone dry battery. With this type of battery, the storage and shipping periods have no deteriorating influence, the battery beginning its working life brand-new when the electrolyte is poured in after delivery to the ultimate customer. The battery line at the car manufacturer's plant can be eliminated, as far as production batteries are concerned. The dealer or service station is not concerned with keeping batteries up and preventing sulphating. Until a battery is delivered to a customer it is merely an inert article of storage which does not deteriorate and can be brought up to about 70 per cent of its maximum charge by the simple operation of pouring in the required quantity of electrolyte.

In the early stages of production, these batteries are handled practically in the conventional manner. The grids are formed from antimony-lead alloy and pasted or filled with lead oxide. Following the latter operation they are dipped and are then dried in a tunnel-type "continuous" oven, after which they are subjected to the forming operation, in which the lead oxide is converted into spongy lead at the negative and peroxide of lead at the positive plate. Up to this point the procedure is the same as with the earlier types of Willard batteries. Wherever possible, operations are performed by automatic machinery or in continuous production lines.

Removes All Moisture

Following the forming operation, the plates are dried out, all moisture being removed by a rapid process which does not promote oxidation. Thus far the plates have been handled in pairs, but they are now separated and burned on to the lead straps. Following this, the rubber thread insulators are introduced and the positive and negative plates are sealed into solid rubber jars. The jars are then assembled in battery boxes, the top connectors are attached, vent plugs are installed, with extra rubber covers which seal the usual vent holes, and the battery is ready for shipment.

It is claimed that when thus prepared the batteries will suffer no deterioration whatever during any reasonable storage or shipment period. Suitable testing instruments connected across the terminals will show absolutely no current, therefore no action is taking place within the cells. The makers assert that this is possible only with the rubber thread type of separator, which is an excellent insulator when bone dry, whereas wood separators cannot be dried out completely. If dry shipment were attempted with wood separators, this moisture content would set up an electrolytic action within the cells, some current flow would be indicated by an instrument connected across the terminals, and the battery would discharge slowly. Under these conditions hard sulphate would form on the plates and ultimately the battery would be destroyed. The rubber thread type of insulator can be dried out completely and is not adversely affected by the introduction of the electrolyte.

Requirements Conflict

In this connection Willard engineers maintain that durability and efficiency from the standpoint of permitting free circulation of the electrolyte are conflicting requirements. If the separators are completely impervious to the electrolyte and cause all flow to take place around their edges, they will have a very long life, but the capacity of the battery will be very low, and cold weather starting will be almost impossible. On the other hand, if the separators are extremely porous and fragile, the capacity of the battery will be high but the period before repairs are required will be short. It is stated that the threaded rubber insulator, in which lateral cotton threads extend clear through a thin corrugated hard rubber sheet, gives a good combination of durability and porosity.

A tag bearing charging instructions is attached to each battery when shipped. One side of the tag reads as follows:

CHARGED BONE DRY

This Bone Dry Battery is shipped with the plates in a charged condition. This battery may be placed in service in approximately 1 hr. time after filling with electrolyte or storage battery acid.

The electrolyte is dilute sulphuric acid having a specific gravity of 1.290. This acid must be pure and suitable for storage battery use.

Electrolyte of proper density (1.290 specific gravity or 32.6 deg. Baume) can be obtained from any Willard Service Station. If desirable it can be prepared from pure concentrated sulphuric acid (1.835 specific gravity or 66 deg. Baume) by adding one part by volume of acid to 2 2/3 parts by volume of distilled water.

Caution: In mixing this electrolyte always pour the acid into the water. *Never pour the water into the acid, as this is dangerous.* Use only glass, hard rubber or lead containers for mixing electrolyte.

Electrolyte of proper density (1.290 specific gravity or 32.6 deg. Baume) can also be prepared by mixing 10 parts by volume of sulphuric acid of 1.400 specific gravity (41.4 deg. Baume) with 4½ parts by volume of distilled water.

Do not add electrolyte to battery directly after mixing. It must be allowed to cool below 90 deg. Fahr. (32 deg. Centigrade) before placing in cells.

The reverse side of the tag contains the following instructions:

After electrolyte has been mixed and cooled, this battery must be prepared for service as follows:

1. Remove soft rubber nipples which are placed over the vent plugs. (These nipples should be discarded, as they must not be used after the battery has been prepared for service.)

2. Remove the hard rubber vent plugs and fill each cell to this level (1 in. over insulators) with 1.290 specific gravity electrolyte. Use only glass, hard rubber or lead containers for pouring the electrolyte into the cells.

3. Replace hard rubber vent plugs on cells. If any electrolyte was spilled on battery it can be removed by means of a wet cloth slightly dampened with a weak solution of ammonia.

4. After this battery has been allowed to stand for 1 hr. after filling with electrolyte, it may then be placed in service.

5. After approximately 24 hr., the level of the electrolyte will fall to the level indicated. If this level is lower than ⅜ in. over the insulators, it must be adjusted *by adding distilled water to the cells.*

In the above instructions paragraphs 2 and 5 are illustrated by small line drawings.

After these instructions have been carried out the available charge in the battery increases rapidly for the first few hours and the charge-time curve then flattens out and ends at 70 per cent of full charge at 24 hr. If the battery has been allowed to stand for a period of 1 hr. after being filled with electrolyte, 4 or 5 hr. driving on the road will bring it to a fully charged condition.

It will be noted that the specific gravity of the initial charge of electrolyte is that of a normal fully charged battery, and since the acid content of the electrolyte is further added to by the additional charge which the battery will sustain and some of the electrolyte introduced is absorbed by the plates, distilled water must be added after the 24-hr. period to bring the electrolyte up to the required level. When the electrolyte is poured in, the temperature inside the battery increases by about 5 deg. Fahr., but there are no other manifestations of any chemical action.

Test Brought No Complaints

When these batteries were first introduced in the automotive field, after having been supplied in slightly smaller sizes to the radio trade for about a year, they were furnished to a Cleveland automobile dealer without his knowledge for a time, and though this was during the winter months there were no evidences of any complaints from customers. This dealer had been receiving bone-dry, uncharged batteries from his factory connection and had been sending them to the Willard plant to be put on the line for charging. Instead of charging his batteries, the plant took batteries of the charged, bone-dry type and filled them with electrolyte as described in the foregoing and sent them to the dealer.

In a demonstration at the plant recently, a battery was taken from the office, where it had been kept for more than six months, and installed in a Dodge car. The electrolyte was then poured in and the engine was turned over and started within 15 min. While this is an extreme case, it serves to demonstrate the possibilities of this system.

This simplifies the car manufacturer's battery problem to a marked degree. Battery deterioration during storage periods of varying length has been a very troublesome factor in connection with quantity production. Extensive charging and boosting lines were required, and often the number of batteries under charge would be ten or more times as great as the number required for the normal daily production. Then there always arises the problem of how to ship the battery with a car that is bound for the Pacific Coast or some other remote point. Winter, with its cold, adds further complications. Until the introduction of the charged, bone-dry battery it was the custom of Willard battery users to ship an uncharged bone-dry battery which could be placed on the line at a charging station in the dealer's community. At least 72 hr. are required to charge such a battery properly, and this slow charging operation was bothersome.

Several car manufacturers are already utilizing the features of this system. Each car is shipped with the charged, dry-bone battery in place and connected up, and a label is pasted on the windshield. This label carries the following warning in English, French and Spanish:

WARNING

The battery on this car is "Bone Dry."

Do not run the engine or use the car until a charged battery has been installed or the battery has been taken off the car and prepared for service according to the instructions given on the tag attached to it.

Unless this is done the generator will be burned out.

WILLARD STORAGE BATTERY CO.
Cleveland, Ohio.

If sufficiently accessible, the electrolyte can be poured into the battery while it is in place in the car, the stipulation regarding the removal of the battery being for the purpose of preventing damage to carpets and upholstery due to the effects of any acid solution which may be spilled.

The car dealer can use old batteries for driving cars to his warehouse or sales establishment. The new battery which has been shipped with the car can be set aside until the customer desires delivery on the new car, at which time the electrolyte can be poured in and the battery brought up to approximately 70 per cent of the maximum charge within a period of 24 hr. By this method the dealer sells a new car with a new battery and is put to no expense for either equipment or service charge for the maintenance of batteries. In the same way, the problem of replacement or service batteries is also simplified. Many car dealers would like to carry replacement batteries for their lines, but have been prevented by the expense and trouble of keeping them in good salable condition. Through the use of the charged, dry-bone battery, a stock can be carried with no complication other than the required storage space.

Certain Advantages Offered

The features of this system are also an advantage to the battery service and sales station in that the necessary stock can be carried like any other merchandise with no need for periodic inspection and treatment. One concern of this kind in Cleveland has determined its average daily replacement business or turnover of new batteries. This number of batteries are set out and filled with electrolyte on the evening preceding each day's business. If the predetermined number should be exceeded by two or three, these extra batteries are put on the line over night with the batteries which are being recharged as a service operation. Sudden or unusual demands can be met almost immediately, due to the elimination of the 72-hr. charging requirement of the older type of battery. When a customer comes in for a size which has not been filled during the preceding evening, this battery is prepared by pouring in the electrolyte before the old battery is removed from the car. By the time this battery has been removed, the new one installed and the transaction completed, the charge has come up to the point where the engine can be started.

Foreign Maker Increases Engine Speed and Decreases Piston Displacement

Godet & Vareille 45.4 cu. in. six incorporates novel jacket construction, built up crankshaft, with roller bearings on crank pins and supercharger. Cylinders are cast separately. Chassis is more conventional. Brakes are on front wheels and gearset only.

By W. F. Bradley

As an example of the pronounced tendency in European countries toward decreased piston displacement, higher engine speeds and a greater number of cylinders than four, the 45.4 cu. in. six-cylinder engine produced by the Godet et Vareille Co. of Paris is interesting. It already has been decided that the 67 cu. in. engine is too big for racing purposes under the 771 lb. weight limit.

This year for the first time France is holding a big international road race for two-passenger cars with a piston displacement limited to only 30 cu. in. The Godet & Vareille engine, therefore, does not rank particularly small for a three- or four-passenger car under European ideas.

Features of this engine include a valve gear designed to give positive opening and closing of the valves, a detachable water jacket, a supercharger, and roller bearing connecting rods. With six cylinders of only 49.7 mm. bore and a stroke of 64 mm. (2 by 2½ in.), the overall length is not great even when the cylinders are cast separately and mounted individually on an aluminum base chamber. Apart from the ease of changing any individual cylinder, the thickness of cylinder walls can be verified carefully and very liberal and perfectly uniform water spaces can be obtained with this type of construction.

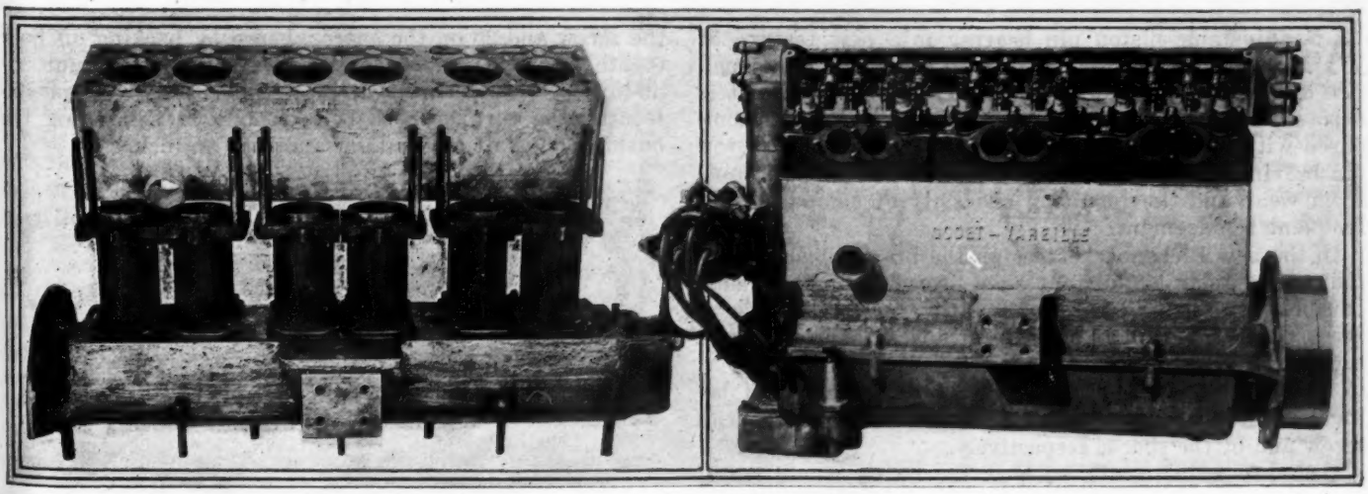
Each of the six cylinders is attached to the base chamber by four studs. This assembly is surrounded by a cast aluminum water gasket screwed down by studs and nuts to a cork gasket on the crankcase. A cast-iron head in three pieces is mounted on the cylinder barrels and the aluminum jacket, and is screwed down to a copper and asbestos gasket by six studs and nuts for each pair of cylinders.

Positive Valve Closing Mechanism

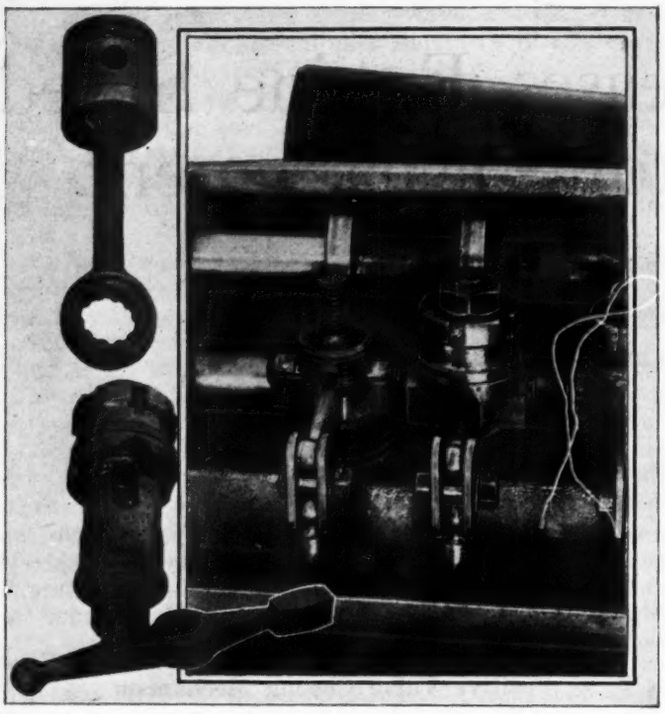
A positive valve closing mechanism that incorporates a flexible mounting which allows for elongation of the valve stem and for the final seating of the valve, is the outstanding patented feature of this engine. Skew gearing and an inclosed vertical shaft at the front end of the engine are used for driving a pair of overhead camshafts mounted in the same vertical plane. One end of each valve rocker is received between each pair of cams, the lower cam opening and the upper cam closing the vertical valve. The opposite end of the rocker is linked to the extremity of the valve stem, as seen in accompanying cuts.

Final seating of the valve is assured by the yielding mounting of the rocker arm shaft, which acts also as a buffer if any obstruction, such as carbon between the valve face and its seat, should prevent complete closing. For each valve there is set in the cylinder head a stud with two elongated slots at right angles to each other. The rocker passes through one slot and the rocker shaft through the other.

A collar carrying the rocker shaft bearings is made a sliding fit on the stud and is screwed down by a nut and



Left, separately cast cylinders, crankcase and water jacket of the new Godet & Vareille six. Each pair of cylinders has a detachable head. Right, the same engine assembled. Two camshafts give positive valve operation. Distributor and detachable supercharger are mounted at the front end



Parts of the Godet & Vareille engine. The twin camshafts and rocker arms with their flexible mountings incorporated in the slotted studs are clearly seen. A two-inch aluminum alloy piston is attached to the one-piece tubular rod which carries a roller bearing at its lower end

lock nut onto a light coil spring. The action of this spring, pushing in an upward direction, is to close the valve. It also keeps the extremity of the rocker in contact with the upper or closing cam, any clearance which may exist being between the rocker and the lower or opening cam. The degree of clearance is adjustable, within limits, by the nut and lock nut on the stud. It is claimed that this valve gear allows the engine to be run at 6000 r.p.m. and prevents all floating of the valves. The spring mounting of the fulcrum point is said to be sufficient to assure final seating. The output of the engine is claimed to be 35 hp. at 4000 r.p.m

While a lot of ingenuity has been expended on positive valve closing mechanism, not much success has attended these efforts up to the present. Delage used a device of this nature on his 1914 racing cars, but did not apply it to any stock models. More recently the Bignan Co. built and sold a sporting type engine with a positive valve-closing mechanism, but this has been withdrawn on the ground that it called for a more delicate adjustment than the average owner was capable of giving.

Will License Valve Closing Device

The Godet & Vareille device has been thoroughly tested and is claimed to stand up to its work, permitting very high speed and also having the advantage of being silent in operation. In addition to using it on their own car, the firm is negotiating for the sale of licenses on other engines.

A built-up crankshaft mounted in four ball bearings is employed. The one-piece tubular connecting rods have roller bearings on the crankpins. Pistons are aluminum alloy with hollow wrist pins. Lubrication of the engine is by pump with feed pipes directing a jet of oil onto each connecting rod bearing.

Bevel gearing from the base of the vertical shaft for driving the overhead camshafts operates the high tension distributor and also the rotary blower for the supercharger. This latter device is so designed that it can be employed or discarded, as desired, merely by removing four nuts. When not in position a cover plate is slipped over the opening in the vertical shaft housing.

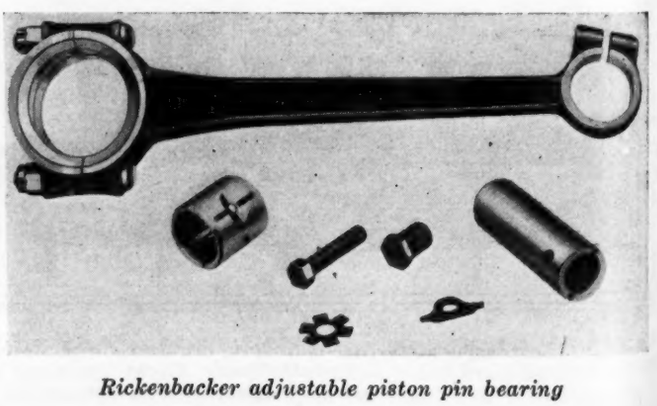
There is less originality in the chassis than in the engine. A plate clutch, a three-speed gearset and a banjo type axle housing are used. The modern French tendency is shown in the absence of brake drums on the rear wheels. Hersot front wheel brakes are used and are pedal operated simultaneously with a transmission brake. There is, in addition, a separate hand control for the transmission brake to hold the car when in a standing position.

Adjustable Piston Pin Bearing New Rickenbacker Feature

AN adjustable piston pin bearing is a new feature of Rickenbacker engine. Owing to the necessarily small size of this bearing, the high temperature to which it is exposed and the greater difficulty in lubricating it as compared with some of the other engine bearings, the piston pin bearing is usually the one giving the greatest trouble from wear and the resulting necessity of comparatively frequent replacement.

In the new Rickenbacker design the bronze bushing has four rectangular equidistant slots broached on the inside parallel to its axis, leaving only a thin wall of bronze at these points. A hollow cylindrical spacer surrounding a solid cap screw serves to permit of accurate adjustment of the bushing, the tools required for this adjustment being two standard wrenches to fit the heads of the cap screw and of the spacer respectively.

Ordinary adjustments, such as the owner would make, can be made even with a single wrench. This is due to the fact that the threads on the cap screw and spacer are of different pitch, there being 24 threads to the inch on the screw and 20 on the spacer, hence by backing off both together, which can be done by leaving the lock nut undisturbed, results in tightening the bearings. One-sixteenth of a turn of both bolts results in tightening the bushing one-half of one thousandth of an inch.



Rickenbacker adjustable piston pin bearing

Future Manufacture Will Be Limited by Slower Industrial Expansion

Restricted immigration together with the rapidly approaching exhaustion of public agricultural lands are important contributing causes for this limitation.

By R. E. Flanders

Manager of the Jones and Lamson Machine Co. and President of the National Machine Tool Builders Association

DUE to the practical cessation of immigration and rapidly approaching absorption of public agricultural lands, the period of broad expansion of industry is drawing to a close in this country, and manufacturers in all lines must awake to this condition in planning for the future. This was the outstanding thought of the address of R. E. Flanders, manager of the Jones and Lamson Machine Co. and president of the National Machine Tool Builders Association, in opening the recent convention of that association.

Although predicated upon contact with the machine tool builders' problems, the analysis of fundamental economic trends which was contained in this speech applies equally to all fields of industrial and commercial effort. In addition to this, that part of the speech which deals with the machine tool builders' problems should be of practical interest to the builders of automotive products who form the largest single group of machine tool buyers. A community of interest has been established between the two industries and the interests of each can be served best by a more thorough understanding of the problems of the other. The substance of Mr. Flanders' speech is abstracted as follows:

We have had a year or more of general prosperity in the industries, tempered by dissatisfaction in the farming areas. The industrial prosperity has been such as to permit of record breaking business in some branches —notably in the steel industry, in transportation, in electrical machinery and in the automotive lines.

All of these branches are important customers of the machine tool industry, yet that has languished. Our barometer shows that the average rate of output for 1923 did not exceed 36 per cent of that for the first quarter of 1920, which is taken as a normal period; and the average rate for the first four months of 1924 is somewhat less. Now general industry itself is slowing down and the prospect looks still more dubious. What is the reason, and what is the remedy?

The Place of the Machine Tool Industry

In accord with the trend of the times we have all been getting a clearer picture of the real character of the machine tool industry and of its relation to the general economic situation. We know that its product is several removes distant from the ultimate consumer, and is therefore subject to violent fluctuations in demand unknown to the producer of flour, shoes and news print paper. People must have some provision of food, clothing and shelter, even in the hardest times, if they are to exist at all; but the country can run on for many months without new machine tools—and in hard times it does it.

Furthermore, the demand for machine tools to make the machinery to make the ultimate product does not appear for some months after the demand for the product itself shows a marked increase; but the machine tool market drops off instantaneously under the first chill breath of an expected recession of demand on the part of the ultimate consumer. The periods of high demand are thus much shorter than those of other industries, as well as more violent.

But all of this is now a commonplace in our own conception of things, however little it may be understood by our customers. There does, nevertheless, seem to be need for a still more fundamental examination of our situation, if we are to steer a true course for the coming months and years. That examination we may well pursue this morning.

The First Basic Factor

The first basic factor in our situation is that our normal rate of output has in the past been largely absorbed by the expansion of industry in this country. Replacement and maintenance of existing equipment would call for a comparatively small percentage of the available machine tool building capacity.

The second basic factor is that the United States has definitely entered on a new era in its economic history—one in which we may safely predict that the rate of industrial expansion will be slower to a marked degree than it has been in the past fifty years. The causes of this slower rate of expansion are also two: The disappearance of public lands of agricultural value and the practical stoppage of immigration.

Of these phenomena, the taking up of the public lands is the more obscure in its effects, but is not, therefore, the less certain or important. A country with a constantly advancing frontier is of necessity a country of expansion. It is a country of growing population, with increasing demands for clothing, shelter and implements of all sorts. In ways which we well understand, this is reflected in enlarging requirements for machine tools.

The stoppage of immigration is an indirect result of the disappearance of valuable public lands. It is only in part due to a fear that our institutions are endangered by the incoming mass of aliens with ideas and ideals foreign to our culture. The real driving power of the sentiment behind restriction is the subconscious appreciation in the mind of the average citizen of a change in living conditions—of a gradual increase in the severity of competition. He is no longer willing or able to cope with immigrants of lower economic standards, whatever their social standards may be.

Lessened immigration evidently slows up the increase

of population and thus directly restrains industrial expansion and machine tool demand. It does the same thing indirectly by cutting off the available supply of rough labor, and thus hindering many large engineering and constructional projects, which if put through to completion, would have a beneficial effect on our business.

There are, of course, other causes of the depression in which we find ourselves. There is little foreign demand in the countries which used to be good customers. The industrial and economic disorganization of the war has but recently shown signs of recovery. The newer industrial countries—Japan, India and China—have not developed rapidly enough to fill their places.

And then there is a final factor, fascinating, but highly problematical. It may be that we are approaching the end of the age of invention. This has often been prophesied in the past, always with resulting discomfiture to the prophet. But it does clearly appear that the most spectacular inventions of our day are of less human significance than the humbler developments of past generations.

We are on the eve of a thirty-six-hour aerial mail service between New York and San Francisco—a truly astonishing development, involving problems of organization and scientific research undreamed of sixty years ago. And yet it is scarcely that length of time since the first crude railroad connection displaced the "Covered Wagon" on the Overland Trail. Can this recent event by any possibility have the effect on the history of our country that the earlier one did?

Millions listen nightly to the eerie magnifications of invisible, inaudible, immeasurable pulsations of the ether. We call it the "radio." With it powerful sending stations girdle the earth. It remains the highest triumph of scientific imagination and analysis. But will it revolutionize the history of the world as did its humbler progenitors, the first steamboat and the Atlantic cable? Do not thoughts like these drive us to the conclusion that the real work of the coming age lies in the perfecting of the social structure—the solving of the problems of the production and distribution of wealth along lines which will enhance the general health and happiness of the average man and his family?

BASED upon contact with machine tool builders' problems, the analysis of fundamental economic trends which is contained in this speech applies equally to all fields of industrial effort.

Analyzing the Future

But to return to the consideration of the state of the machine tool business and of the trend of its policies. It is sufficient if the more general discussion has emphasized two facts: First, that our industry is only in part a barometer of business activity; it is pre-eminently a barometer of business expansion. Second, it is sensitive to major social movements quite beyond our control; we must adapt ourselves cheerfully to new conditions, for there is no hope in any attempt to pull backward up the stream of history.

The present condition, then, is that our industry has grown to supply the needs of a general industrial expansion—which has for the present slowed down—plus the needs of an acute war-time expansion—which we devoutly pray may never come again. What are the prospects for getting business to employ our idle plant, equipment and workmen? Let us explore the possible channels of improvement, one by one.

In the first place there is always the hope of some new and rapidly growing development, as typified by the bicycle, and later by the automobile. The truck, the tractor and the airplane have in turn been hailed as worthy successors of the first two, but so far their influence has been disappointing. They may be counted on, however, for a more or less steady growth which will produce benefits measurable in the long run.

Anticipates Steady Growth

There will be again a steady growth of our machine-made civilization, quite irrespective of an increase of population. As an illustration I have used the fact that all this past winter in my home town, in the extreme northeast section of the country, it was possible to buy the most delicious ice-berg lettuce at 15 cents per head, or two for a quarter. Inquiry revealed that it came from the Imperial Valley, 2500 miles away as the crow flies, and 1000 miles farther by rail. This is typical of the increasing service rendered by an advancing civilization. It is based on an elaborate organization of personnel and equipment, of trucks, agricultural machinery, refrigeration, cars and locomotives—all in turn based on the machine tool as a foundation.

Added to this expansion of civilization will be a certain degree of expansion of population, due to natural increase irrespective of immigration. This will demand its small share of industrial expansion, with a consequent demand for our product.

Furthermore, in judging of the effect of restricted immigration, we have to reckon with the fortunate fact that it will directly increase the demand for machinery, thus compensating in part for the sinister indirect influence already described. So-called "rough labor" is slowly but steadily disappearing from the fair face of our land. The Italian, the Hungarian, the Pole, the Russian, are leaving the ranks of the day laborers and climbing the social ladder. There is plenty of room at the bottom, with no one to fill the room. The last ten years have seen a remarkable development in contractor's and other types of machinery designed to fill the place of the day laborer. That development is bound to continue and will offer us its share of sustenance.

No more pregnant scene has come to my eyes than appeared around a bend in the road the other day, a few miles from my home. The State Highway Department is removing some dangerous curves at this point and the work necessitates the blasting away of several spurs of hard granite rock. Fifteen years ago the blast holes would have been sunk by three laborers, one of them holding a drill while the other two wielded hammers. That was not what I saw last week. There was only one man visible; but he had a heavy truck, on which was mounted a portable gasoline engine connected to an air compressor. From its receiver a rubber hose led to the up-to-date pneumatic drill which the lone workman was operating. Fifteen years ago—three men and $5 worth of equipment. Today—one man and $5,000 worth of equipment. Changes like these give us courage for the future.

There is one disturbing reflection to be drawn from this picture. An expenditure of capital was required

for the modern method one thousand times greater than was needed in the old days. While this ratio is unusual, it but emphasizes the fact that the diminishing forces of rough labor can only be replaced by an enormously increasing investment. The present situation, under which the great reservoirs of capital are poured into tax-free bonds rather than into the channels of industry, constitutes the largest single handicap to the prosperity of manufacturer, workman and farmer alike.

Last on the list, but not least, are the opportunities offered by the replacement of obsolete equipment. Many factors are required to bring success along this line. Among them are: A product kept up to date, of the best possible design, materials and workmanship in view of all the requirements of the situation; specialized, intelligent, persistent salesmanship, to overcome lethargy and skepticism; a farsighted viewpoint on the part of the customer; and, finally, as in the previous instance, conditions favorable to an abundant supply of capital for industrial improvement.

Regarding the future, my own prophecy would be that we are faced by several months of business that will be neither desperately bad nor "rather poor," but somewhere in between. Beyond that point the indications on which I have elaborated appear to point to a gradual improvement extending over a period of years. We may reach our full capacity in three to four years, or it may take ten to fifteen. The question of how long it will take to arrive at the desired consummation depends mainly on two elements: A wise measure of tax reform and an increase in confidence and fair dealing between the various elements of the social structure.

The advance in business during this period will not be uniform. The cyclic fluctuations will still continue, but with lessened violence. The high points will not be so high, nor the low points so low, as in years past. The lesson of the business cycle is being learned and every individual manufacturer who adjusts his own business to it assists in soothing its perturbations.

A friend of mine, traveling in Japan, fell in with a Japanese student—a slender youth with large glasses. In a conversation that ranged the whole field from religion to the metric system, my friend inquired whether or no he were an optimist. After careful thought the student replied, "I am an optimist, but neither a hasty nor a superficial one." We have reason to be optimists, but we will be wise to follow the lead of our young Japanese friend, rather than to pump ourselves up to the bubbling enthusiasm of a Babbitt. May we have optimism, but let it be neither hasty nor superficial.

This is not a sermon and needs no text. Yet may I invite your attention, not irreverently, to the thirteenth verse of the sixteenth chapter of St. Paul's first epistle to the Corinthians: "Watch ye, stand fast in the faith, quit you like men, be strong."

That optimism must be based not on what we can accomplish as machine tool builders but upon our duties and opportunities as citizens.

Jobbers Will Handle Boyce-ite

INASMUCH as one of the most frequent service operations on all automotive engines is that incident to the scraping of carbon and grinding valves, considerable interest is likely to result from the marketing on a national scale of a product termed Boyce-ite, which is claimed to render these operations unnecessary through its ability to keep the engine free from carbon, or to remove carbon deposits once they have accumulated.

Boyce-ite, a product of Boyce & Veeder, Long Island City, N. Y., is not a fuel "dope" in the ordinary sense of that term, although used as an ingredient of fuel, and is not sold as a knock preventive or deterrent except in so far as it is claimed to prevent knocks which are due to carbon deposit, once such carbon has been cleaned out by use of the liquid.

Boyce-ite is being handled exclusively through jobbers after introduction through dealers, but an effort will be made to have car manufacturers furnish a supply with each car shipped together with instructions to the user to add the liquid to the fuel immediately there are any indications of knocking due to carbon.

It is claimed that if this course is followed the manufacturer of the car will be saved much expense for carbon removal and valve grinding which, in some cases, is now done without charge to the owner under the 90-day guarantee. When the factory or service station does not perform this operation without charge to the car owner, the latter will be saved this expense, for, even though Boyce-ite fails to perform the function for which it is intended, the owner can collect from Boyce & Veeder for the cost of having the carbon burned out, under the guarantee given with this product.

A number of tests have been undertaken on Ford cars having badly carbonized engines. A report on one such test conducted by the Mason Laboratory, Sheffield Scientific School, Yale University, shows that an engine which developed a maximum b.hp. of 9.03 at 20 m.p.h. and 13.24 b.hp. at 30 m.p.h. when carbonized developed, after using Boyce-ite on the road for 400 miles, 11.7 and 16.0 b.hp., respectively, at the same speeds. At the same time the fuel consumption at full load decreased from 1.15 and 1.05, respectively, to 0.95 and 0.94 lb. per b.hp.hr. while the miles per gallon under level road—part load—conditions increased from 21.0 and 19.4 respectively to 23.5 and 21.4.

The report on this test states that at the start of the test the engine was full of carbon and knocked badly but otherwise was in good condition. The car was driven 400 miles, using Boyce-ite in accordance with directions. "Engine knocking disappeared after first 200 miles and increased power was noted on hills. The fuel economy increased during second 200 miles."

Boyce-ite is said to be non-evaporating, non-poisonous and non-explosive and is claimed to be absolutely non-injurious to the engine. Comparatively high temperatures are said to be favorable to its action and the cleanest parts of the engine in which it has been employed, it is asserted, are the exhaust valves and parts of the combustion chamber adjacent to them. On the other hand, periods of steady running at full or high loads are understood to be less favorable to carbon removal by Boyce-ite than operation under the normal conditions of service in which the engine is allowed to cool off between periods of running. In an engine which is inclined to run warm, Boyce-ite is reported to act more rapidly than in one which seldom attains high temperatures.

For the removal of carbon deposits already accumulated, Boyce-ite is used in the proportions of ¼ pt. to 10 gal. of gasoline, but when used steadily to prevent carbon formation in a clean engine the proportions recommended are ¼ pt. to 20 gal. of fuel.

New Chucking Machine Is Pneumatically Controlled and Operated

The New Britain Machine Co. has developed a completely automatic chucking machine, called the New-Matic, in four and six spindle types which is adapted to many automotive production operations and is so arranged that one operator can attend to two machines.

A MULTI-SPINDLE work rotating automatic chucking machine, known as the "New Britain New-Matic," has been developed by the New Britain Machine Company, New Britain, Conn., and is illustrated here. A feature of this machine is that compressed air is used not only for chucking the work, but also for operating the clutches through which the spindles are driven for applying a brake to the spindle as it moves into the loading position and for operating a safety device.

The new machine is of the horizontal type, the reasons given by the maker for the choice of this type being that it prevents chips from falling into the bushing holes where the tools are piloted in bushings and affords complete vision of tools and work at each stage of operation. Two sizes of these machines have been developed, each made with four or six spindles, the designs being otherwise substantially alike. The spindles are carried in an indexing head or drum, which is indexed at the proper periods by a Geneva stop motion. The spindle, which is directly in front of the operator, is in the loading position and is disconnected from the drive, while all the rest of the spindles are being driven and the parts held in the chucks on these spindles worked upon.

Air Operating Features

Reference has been made already to the pneumatic chucking and clutching device. This is so worked out that a single air cylinder suffices to perform for the whole series of spindles the various operations accomplished pneumatically. This air cylinder is located on the forward side of the machine, to the operator's left, and can be plainly seen in the front view reproduced here. It is double acting and contains a piston with two leather cups backed up by disk-type bronze springs. The piston rod is made of bronze, for the reason that there is a possibility of water entering the cylinder with the air, and of a steel rod giving trouble from rust on this account.

The piston rod connects to a vertical slide, in the inner side of which there are three cam grooves for operating the chuck, the spindle clutch, the spindle brake and the safety device. These cam grooves are so arranged that the different operations take place in proper sequence. For instance, when air is admitted to the cylinder below the piston, the chuck is operated first and then the clutch is engaged. When the operator reverses the position of the air valve (which is located conveniently for his left hand) the sequence of operations is reversed; that is, the clutch is first disengaged, the brake is applied to the spindle and the chuck is then released.

Referring to the four-spindle machine, there are three transverse or radial slides and one longitudinal slide. One or more tools carried by each of the radial slides operate on the work held in the chuck, which occupies a position opposite. On the other hand, the longitudinal slide carries tools operating upon parts in all of the chucks in working positions. Thus many cuts may be taken simultaneously and the period of a single operation, or the indexing period, depends upon the longest time required for any single cut. Therefore, in working out the machining method, operations which require a comparatively long time, such, for instance, as the boring of a long hole, are sometimes divided into two operations, and accomplished partly in one position of the indexing head and partly in the next.

Safety Devices

As already pointed out, the indexing is accomplished automatically, and as long as the operator keeps step with the indexing motion in chucking parts, the automatic action will continue. If the operator should not have completed the chucking operation at the time the machine is ready to index, the indexing mechanism is thrown out. Then, after the piece has been properly chucked, the operator restarts indexing by throwing in the power feed mechanism.

Ordinarily an operator attends to two machines, which are installed face-to-face. Should he turn from one machine to the other while the latter is at any part of the indexing operation, it is impossible for him to operate the air valve, which is locked during the indexing period. This constitutes another safety device.

Occasionally a longitudinal feed motion of unusual length is required, as, for instance, in reaming, and in order that this may not take much more time than the shorter cuts taken by tools carried by the same longitudinal slide, a special accelerating device is provided on this slide, in which the tool requiring the long feed motion is mounted.

Accelerated Feed Device

The longitudinal slide is bored out to a considerable diameter in line with the indexing position where the long feed motion is required, and a cylindrical block is inserted in this bore and carries the tool. An extension to the right of this accelerated slide is guided in a bearing on the longitudinal slide further to the right and carries a shipping collar from which a forked lever extends in the direction of the operator. This lever is supported from a pedestal on the longitudinal slide through a pair of links, and when the longitudinal slide reaches a certain point in its travel, the end of this

lever abuts against a stop and the accelerated slide then moves relative to the main longitudinal slide in addition to moving with it. A spring on that portion of the extension projecting beyond the bearing returns the accelerated slide after the operation has been completed.

It will be noticed from the illustrations that the ways of the longitudinal slide are located at the mean height of the several groups of tools, hence there is no overturning tendency or no great leverage of the reaction of the cutting tools on the ways. Raising the ways beyond the usual height also gives more space for the cam drum, and a drum of large diameter means better control of the feed and return motions.

The cam drum is clearly shown in the rear view of the machine. It is driven by an internal gear and pinion. The driving pinion is located at the top of the gear, with the result that the points of reaction between pinion and gear, cam and cam follower, and cam drum and thrust block respectively, are nearly in line and closely adjacent to each other. It results from this that the shaft carrying the cam drum is relieved of all torque due to the main cam drive and is subject only to torque load incident to the drive of the cross-feed slides.

Main Feed Cams Universal

The drum shaft carries a double cam in line with the cross-feed slides, these cams being of volute form. Different cams can be fitted to meet different requirements. The main cams, on the other hand, are universal and can be set to give a greater or smaller feed motion. These cams are made of three laminations, so they are flexible and will conform to the cylindrical surface of the drum irrespective of the angle at which they are set. The cam is secured by means of cap screws threading into nuts located in T slots in the surface of the drum. Adjustments are made by means of set screws in backing up blocks. A base line is turned on the drum and by means of markings at quarter lengths of the cam and this base line it is a very easy matter to obtain the precise setting necessary for any length of feed.

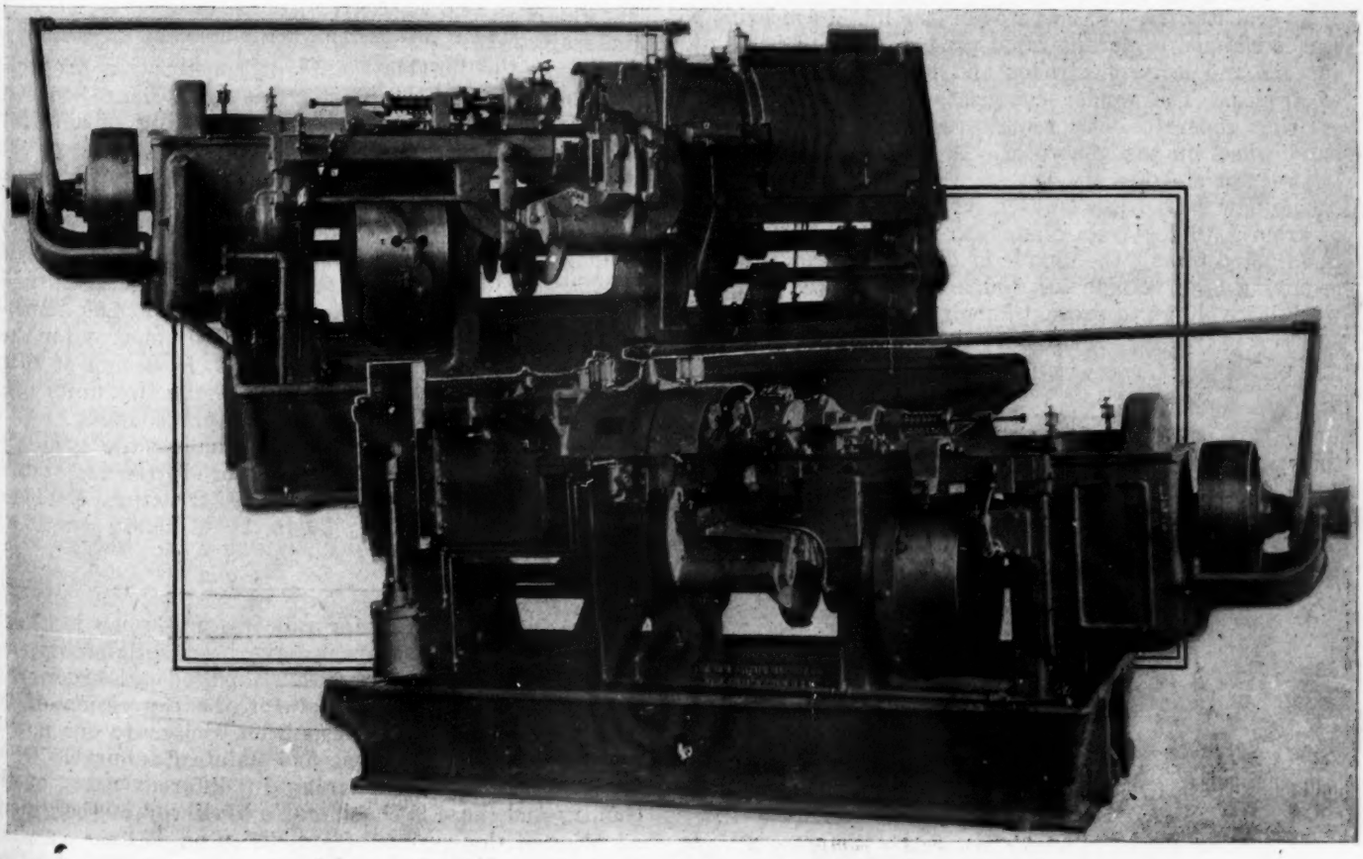
The power feed control lever and the hand feed lever, which latter is removable, are located close together in a position convenient for operation by the operator's right hand, and they are so arranged that it is impossible to insert the hand feed lever when the machine is set for power feed, and impossible to set the machine for power feed when the hand feed lever is in position.

Elliptic Gears in Indexing

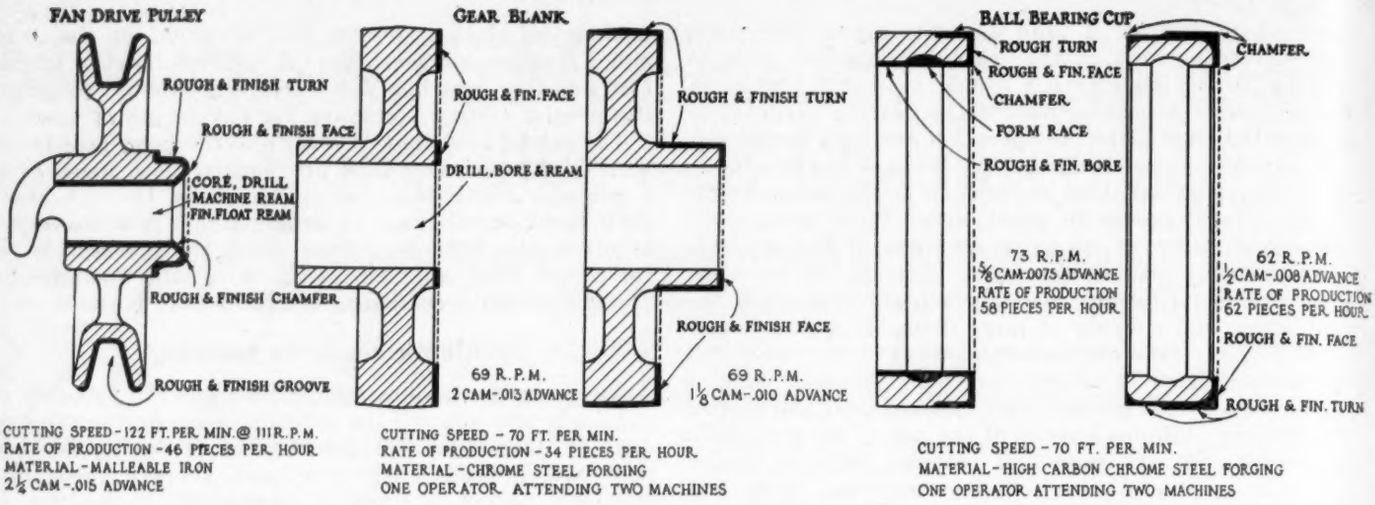
Although the Geneva stop motion has the property of gradually accelerating the indexing drum during the first part of its motion and decelerating it during the last part, which tends to give a good average speed, the indexing period is further decreased by the use of elliptic gears driving the index arm.

The indexing head carrying the group of spindles is a single heavy casting consisting of three cylindrical portions connected together by a central neck. This head is finished and all core sand removed. In the center cylinder, which is the widest, the indexing slots are cut and the ball thrust bearings for the spindles are carried. The rear cylinder carries the indexing gear ring and the rear bronze bearings, while the front cylinder carries the forward bronze bearings. These bronze bearings are split and provided with shims. They have conical surfaces on the outside and are located in conical holes and can be adjusted by filing down the shims and drawing them through their supports by means of nuts with square threads. Access to these bearings is through a hand hole with cover plate at the rear side.

The spindles are made of chrome vanadium steel, heat treated and hardened at the bearing surfaces. They are



Front and rear views of the New Britain New-Matic automatic chucking machine


FAN DRIVE PULLEY
ROUGH & FINISH TURN
ROUGH & FINISH FACE
CORE, DRILL
MACHINE REAM
FIN. FLOAT REAM
ROUGH & FINISH CHAMFER
ROUGH & FINISH GROOVE
CUTTING SPEED - 122 FT. PER. MIN. @ 111 R. P. M.
RATE OF PRODUCTION - 46 PIECES PER. HOUR
MATERIAL - MALLEABLE IRON
2½ CAM - .015 ADVANCE
GEAR BLANK
ROUGH & FIN. FACE
DRILL, BORE & REAM
69 R. P. M.
2 CAM - .013 ADVANCE
ROUGH & FINISH TURN
ROUGH & FINISH FACE
69 R. P. M.
1⅛ CAM - .010 ADVANCE
CUTTING SPEED - 70 FT. PER MIN.
RATE OF PRODUCTION - 34 PIECES PER. HOUR
MATERIAL - CHROME STEEL FORGING
ONE OPERATOR ATTENDING TWO MACHINES
BALL BEARING CUP
ROUGH TURN
ROUGH & FIN. FACE
CHAMFER
FORM RACE
ROUGH & FIN. BORE
73 R. P. M.
⅝ CAM - .0075 ADVANCE
RATE OF PRODUCTION
58 PIECES PER. HOUR
CHAMFER
62 R. P. M.
½ CAM - .008 ADVANCE
RATE OF PRODUCTION
62 PIECES PER. HOUR
ROUGH & FIN. FACE
ROUGH & FIN. TURN
CUTTING SPEED - 70 FT. PER. MIN.
MATERIAL - HIGH CARBON CHROME STEEL FORGING
ONE OPERATOR ATTENDING TWO MACHINES

Drawings illustrating operations of the New-Matic chucking machine on various automotive parts

made hollow to permit the drawing-in rods to pass through to the chucks. A large, hardened steel locking bolt is provided for the indexing head.

The large base assists in stiffening the frame and forms a chip pan and an oil strainer and reservoir. It is of double walled box-girder section. The bed itself is securely bolted to this base. The bed slopes toward the rear, so any chips that fall on to it will slide off into the base.

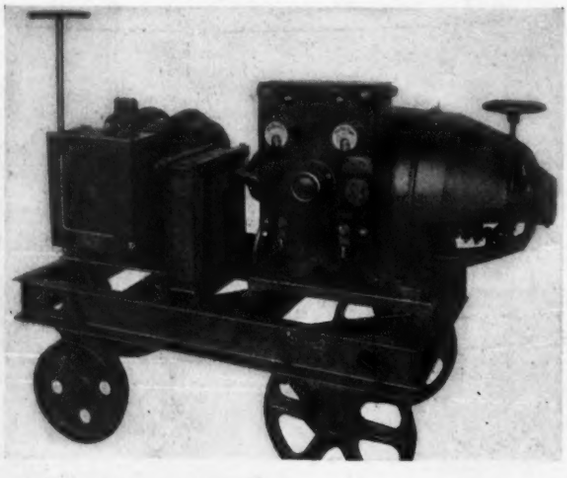
The drive is through a single pulley, located at the right-hand end. This pulley is provided with a friction clutch, hence the machine can be driven directly from the main power line if desired. Drive from a countershaft or electric motor can also be provided for.

While the machine described is of comparatively recent design, more than one hundred are already in use in the machining of ball bearing races, etc. Several parts that are machined on these machines are illustrated here, and operations and rate of production are in all cases given on the drawings.

General Electric Brings Out New Portable Arc Welder

A NEW portable arc welder brought out by the General Electric Co. operates on the metal arc principle and is claimed to permit rapid production with both high current and large electrodes and low current and small electrodes. The welder comprises a motor and a self-exciting generator. Current is regulated by means of a hand wheel on the generator. A self-adjusting stabilizing reactor steadies the arc.

The new welder can be used with commercial electrodes of from 1/16 to ¼ in. diameter. The generator voltage is adjusted to suit the character of the work, heavy work requiring high voltage for complete penetration and light work low voltage to prevent burning. The current can be varied between 75 and 300 amperes in a large number of steps. It is claimed that the arc is easy to start and maintain.



General Electric portable arc welder comprises a motor and self-exciting generator

Among the notable points of construction are roller-bearing wheels, holes in the case for crane hooks and waste-packed bearings preventing spilling of oil if the welder is tipped when being moved. Either long or short leads can be used, making it possible to work at a distance from the set as well as close by.

The generator is a two-pole constant energy type, with a dual magnetic circuit, and can be operated by one man. Working at 60 volts on open circuit and at 20-25 under load, it is capable of a continuous output of 200 amperes, of 250 amperes for an hour and of 300 amperes for short periods. The motor is a standard G. E. design of 10 hp. There are three bearings in the set, the two units being close-coupled by means of a solid flange coupling. All of the components of the welder, including the generator, motor, generator control panel, motor starter and stabilizing reactor, are mounted on a welded structural steel base. The unit measures 63 by 29 in. by 47 in. in height and weighs about 1600 lb.

Experiments with motor railcars on French local railways during the past year have been satisfactory, and the Government Railways have placed an order with Schneider & Cie. of Creusot for the conversion of ten more coaches for motor propulsion, similar to one now in service between Montaigne and Sainte Gauburge. Other types of railcars are running in different parts of the country and there is considerable likelihood of the general adoption of this system of propulsion on all lines on which the traffic is light and which are now operating at a loss.

Ternstedt Introduces New Line of Heavy Duty Bus and Taxi Hardware

Designs are similar to those for passenger car bodies with parts made heavier to withstand strenuous demands of this particular kind of service, and were determined only after data had been acquired on wear, repairs and replacements.

IN order to meet the strenuous demands of bus and taxi service, a new line of body hardware, known as the Hevyduty, has been introduced by the Ternstedt Manufacturing Co. of Detroit. While the design of the new line is similar to the hardware which has been developed by this company for the passenger car field over a period of several years, the strength of each individual part has been increased, following a campaign of research in the field and cooperative with the leading builders of bus bodies.

The complete line embraces the following items: Window regulators and their handles, sash brackets, door locks, striker plates, compartment locks, outside door handles, door bumpers and anti-rattlers, metal door checks, strap hinges, concealed hinges, guide hinges, curtain rollers and end posts, foot rest brackets, pull-to handles, kick plates, and a special line of heavy duty lead-filled molding and rolled channels and shapes.

Two or three years of more modern bus development are said to have demonstrated that the usual types and sizes of passenger car body hardware are deficient when applied to the larger vehicles. While windows and other parts of the bus body are not appreciably larger or heavier than those of the closed car, ordinary fittings, it is reported, have not stood up to the demands of the newer class of service. High speed buses introduce entirely new requirements of durability and operation. The combination of weight, bulk and speed sets up stresses which are extremely destructive to the body fittings of the passenger car type.

Stops, Entrances and Exits Considered

In addition to these elements, the wear and tear of public utility service as compared to more or less private operation must also be considered. The number of stops, exits and entrances of one day's operation is several times that of the ordinary closed car. The acceleration and deceleration factors, quick get-away and stopping have also introduced new requirements when the weight and size of the vehicle are considered.

In the development of this new line of hardware, Ternstedt engineers spent several months in contact with bus operators, gathering first hand evidence of the effects of this new type of operation. The service and repair experience of the company was also utilized. No attempt at introducing radically new types has been made. The design in each case follows lines that have demonstrated their ability to fulfill the desired function. The basic design is similar to the passenger car hardware, but sections and bearings have been increased to withstand the more severe stresses.

One of the outstanding features of the new line is the Hevyduty regulator, which is built in three different styles. All three are crank operated through a pinion and gear, the latter being centered on the same shaft that carries the driving sprocket which actuates the lifter chain. In accordance with this company's conventional construction, the gear on the upper shaft carries a spiral counter-balancing spring, as illustrated in Fig. 1.

A double-acting cam and roller clutch which locks the window after travel in either direction is also mounted on the operating shaft, as illustrated in Fig. 2. The chain which carries the lift pin has been made considerably heavier and the lower end of the regulator frame has been extended to allow its anchorage at the bottom of the door.

Right and Left Hand Types

The standard type of regulator, illustrated in Fig. 3, is intended for door installations and is made in right- and left-hand types, so that the regulator handle, which is offset 3 in. from the center of the regulator, can be placed to the forward or rear of the center of the doors at either side of the bus, in accordance with the demands of the design or taste of the designer.

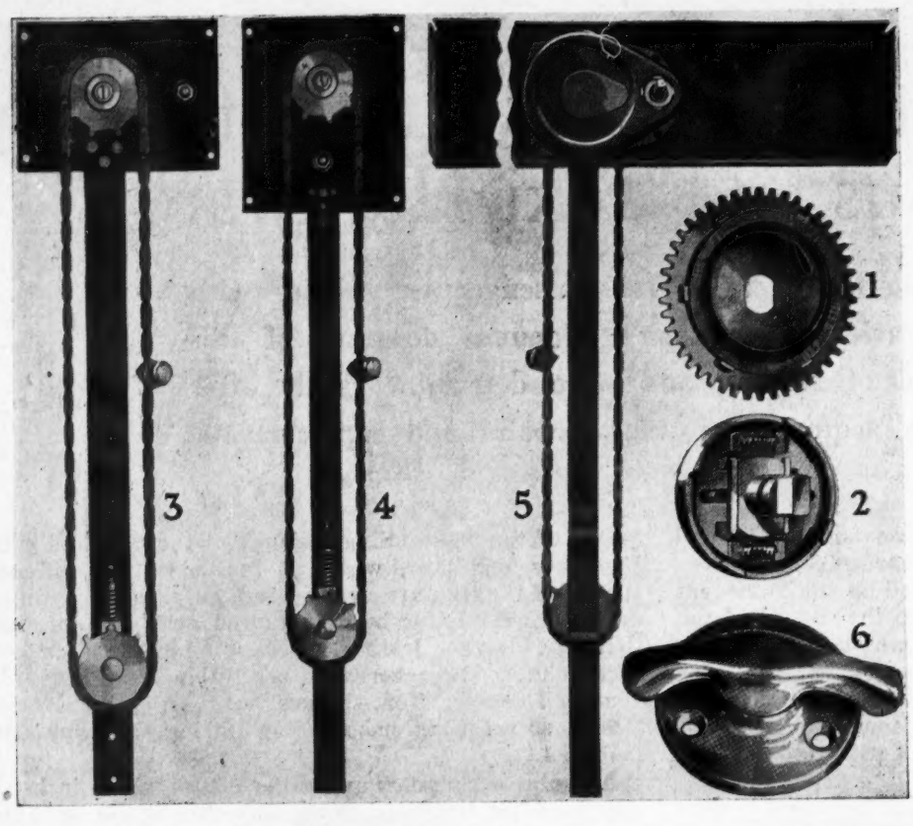
Care has been exercised to limit the size of the regulator mounting plate so that the larger portion of the lock board will remain intact after the recess for the regulator is made, thus retaining a greater degree of rigidity in the entire door.

Greater rigidity in the regulator frame has been brought about by increasing the section of the vertical member. While the length of this regulator is specified as the distance, center to center, between the upper and lower sprockets, the effective window travel is about 2½ in. greater than this figure as the lift pin, which is shown on the chain, travels from the lower center of the lower sprocket to the top center of the upper sprocket.

Center Partition Type

Two other types of regulator construction incorporate similar working parts, the difference being in the general arrangement for special purposes. Fig. 4 shows the center partition type, which is designed for installations in which it is desired that the regulator handle be placed as near the floor as possible. This type of regulator usually is installed in the centerline of the glass travel, but may be offset if necessary.

Fig. 5 illustrates the unit type, which is intended for use exclusively in the windows of larger buses and coaches. It is not applicable for door installations. The



Special Bus and Taxi Hardware

Fig. 1—*Main gear and counterbalance spring of the Hevyduty window regulators*

Fig. 2—*Cam and roller type of clutch which insures detention after operation in either direction*

Fig. 3—*Standard type of bus door window regulator*

Fig. 4—*Center partition type of regulator which brings the operating handle as close to the floor as possible*

Fig. 5—*Unit type of regulator which is intended for use in large or heavy windows at other than door installations*

Fig. 6—*Regulator control handle which is featured by a bolted flange mounting plate*

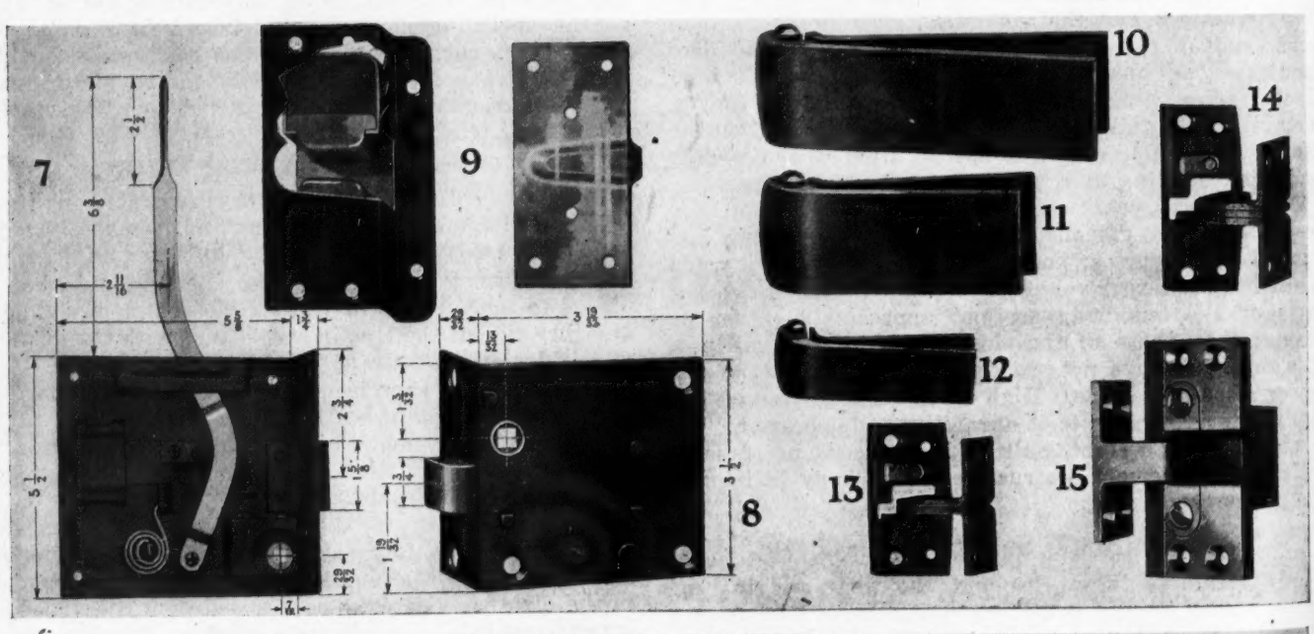


Fig. 7—*Coach door lock of unusually large and substantial proportions*

Fig. 8—*Open body door lock, of the same type but somewhat smaller*

Fig. 9—*Giant dovetail door bumper*

Fig. 10—*Long type strap hinge*

Fig. 11—*Short type strap hinge*

Fig. 12—*Guide hinge*

Fig. 13—*Pressed steel concealed type hinge*

Fig. 14—*Larger pressed steel concealed hinge*

Fig. 15—*Largest type of concealed hinge which has a reinforced die-cast pillar box*

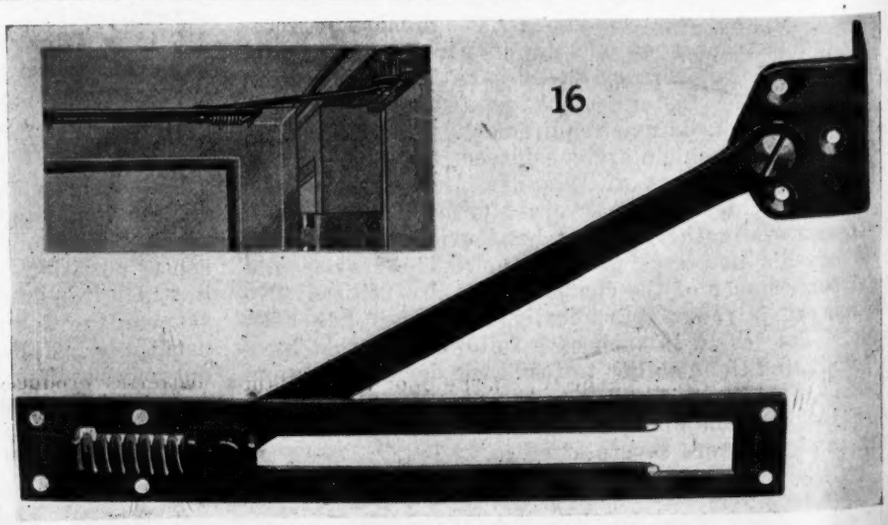


Fig. 16—*Metal door check which is installed at the top of the door and has a cushion spring which acts at the extreme position*

steel extension back plate is integral with the regulator. As installed, this type has the double advantage of holding the regulator more rigidly in place as well as serving as a brace or stiffener for the body itself. This type is supplied in the center partition design or the offset type, either right or left hand.

In conjunction with the heavier regulators, a heavier handle of special design, shown in Fig. 6, incorporates a flanged mounting plate which is attached directly to the body frame by three bolts. This construction varies from the three other heavy types in that the flanged plate is attached to the frame instead of being screwed into the regulator body. The handle engages with the spindle of the regulator clutch to provide a positive connection. All of these handles are drop forged from brass and finished either in bright or satin nickel.

Oversized Locks

In view of the wear and tear which has developed in bus and coach doors, a new oversize lock has been developed. This is shown in Fig. 7. This lock is featured by its construction of pressed steel and brass forgings throughout and its compact characteristics which again require but a very shallow mortise in the lock board. This being the case, the strength both of the lock board and pillar is conserved. Cold rolled steel of 7/32 in. thickness and 9/16 in. width is used for the operating lever, while the frame of the lock is pressed from 13-gage steel. The tumbler is a brass forging.

The bolt pull bar also is stamped from cold-rolled steel and is riveted to the hardened bolt end of a 1⅝ in. width, which is cut from cold drawn steel of the finished cross section. In addition to being screwed into the lock board, four screw holes are provided for attachment to the door pillar. A similar type of lock of somewhat smaller dimensions, as illustrated by Fig. 8, has also been designed for open bodies. Heavier door handles and striker plates, which are intended for use with these locks, have been in production for some time.

Giant Door Bumpers

Another item of door hardware is the new giant dovetail bumper illustrated in Fig. 9. This bumper is about twice the size of the conventional passenger car bumper and is further distinguished by the pronounced tapers on both sides of the wedge plate which are designed in to keep the heavy doors of the bus body quiet. The tongue or wedge plate is a manganese bronze casting, while the casing is a galvanized steel stamping. The cushions are a resilient grade of rubber and are capped by steel stampings at the bearing surfaces. The cap is a black enameled steel stamping and completes the assembly, which is attached to the body pillar.

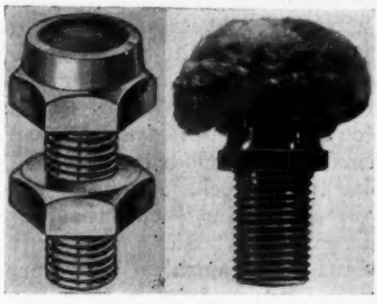
Heavier, more substantial construction also characterizes a complete line of hinges, which includes three strap types, as illustrated in Figs. 10, 11 and 12, which are termed respectively the long type, short type and guide hinge. Two all-pressed steel concealed hinges are shown by Figs. 13 and 14, while Fig. 15 illustrates another concealed hinge of very liberal dimensions. In the latter hinge, the pillar box is made of a reinforced die casting. The hinge knuckle is drop-forged steel and the bearing pins and containers are cold-rolled steel. While these hinges have much the same appearance as the conventional passenger car body type, sizes and sections have been increased throughout for bus service.

A pressed steel door check which fits on the top of the door is illustrated in Fig. 16. As both members of this check are located in the top of the door and the top of the body respectively, they are entirely out of the way. Any strains involved are thrown on the longitudinal members of the body and door and the design is such that none of the installation screws are subjected to direct tension tending to pull them out. As the slide on top of the door acts in the direction of the plane of the door and toward the body, no additional load is thrown on the hinges. Any tendency in this direction is cushioned by a compression spring at the end of the slide which comes into action as the door approaches the open position.

In addition to the items which have been described and illustrated, the Hevyduty line includes a new type of curtain roller with both stamped steel and die-cast end posts. Heavier pull-to handles of nickel-plated brass, stamped aluminum kick plates and aluminum foot rest brackets are also included. To meet the balance of the body trimming demands, several different sizes and sections of rolled steel sash channels, zinc runningboard and floorboard molding, lead-filled molding and trunk-rack molding also have been designed and put into production. All of the hardware is subjected to a rust-proofing process where any possibility of steel parts remaining unfinished exists.

Fabroil Used in Tappet Screws Eliminates Noise

ABSOLUTE silence at the valve tappets is stated to be the result when patented Fabroil silent tappet adjusting screws are employed in automotive engines. This device, which is the product of John C. Hoof & Co. of Chicago, combines the adjustable features of the ordinary steel valve tappet adjusting screw with a slightly resilient contact surface which is made of Fabroil and pressed into a cupped recess in the head. Fabroil is similar in structure to Textolite timing gears, consisting of compressed cotton fibers and a hard binder. In the case of the plug in the head of this adjusting screw, the fibers extend horizontally and are highly compressed.



Fabroil tappet adjusting screw, showing fibers before they are compressed into the cupped head and the completed screw

It is stated that under the conditions which obtain at the head of this screw, the Fabroil head will outwear the usual hardened steel surface. The material shows a scleroscope hardness of 60 and is claimed to have sufficient resiliency to eliminate any noise due to impact. Fabroil is a development of the General Electric Co. and its application to the head of tappet adjusting screws is made under license to John C. Hoof & Co. The latter company asserts that these adjusting screws can be supplied for 90 per cent of all American cars from stock.

STORAGE batteries used on airplanes have to work under extreme conditions. It is essential in this service to obtain the maximum possible output from a given weight, while the total length of life of the battery is of comparatively little importance. At the request of the Bureau of Aeronautics of the Navy Department, the Bureau of Standards has been making tests on airplane batteries produced by a number of manufacturers. The information obtained from these tests has been used in revising the Navy specifications for such batteries.

How Rubber Shackle Blocks Are Inspected and Tested

Chemical and compression tests are made on rubber blocks which act as shock insulators on all Mack trucks. Long lived service has proved the value of accelerated aging tests made in the beginning when information was lacking.

RUBBER shackles or shock insulators, which have been used for the past three years on Mack trucks and buses, are subjected to inspection and tests by two departments before they are assembled on the vehicle. In the engineering department all samples submitted by different manufacturers of blocks are tested and all service complaints are investigated, while in the Inspection Department the more general tests given all blocks received are carried out.

All sample blocks, whether taken from stock or submitted by manufacturer, are given a test number, and records are made covering the name of the manufacturer, part or drawing number, number of blocks in lot, identification marking, Shore hardness and elasticity, weight, color, result of a compression test and date of test.

Compression tests are made on the blocks under increasing loads, and the compression under each load is noted. After the predetermined maximum compression has been reached, the load is gradually reduced by the same steps by which it was increased, and the compression under each load is again noted, as well as the set when the load is fully removed. From the data thus obtained a hysteresis curve is plotted, and the smaller the included area of this curve the better is the rubber in the block. After this test, the blocks are examined for cracks and seams that may have opened up under load.

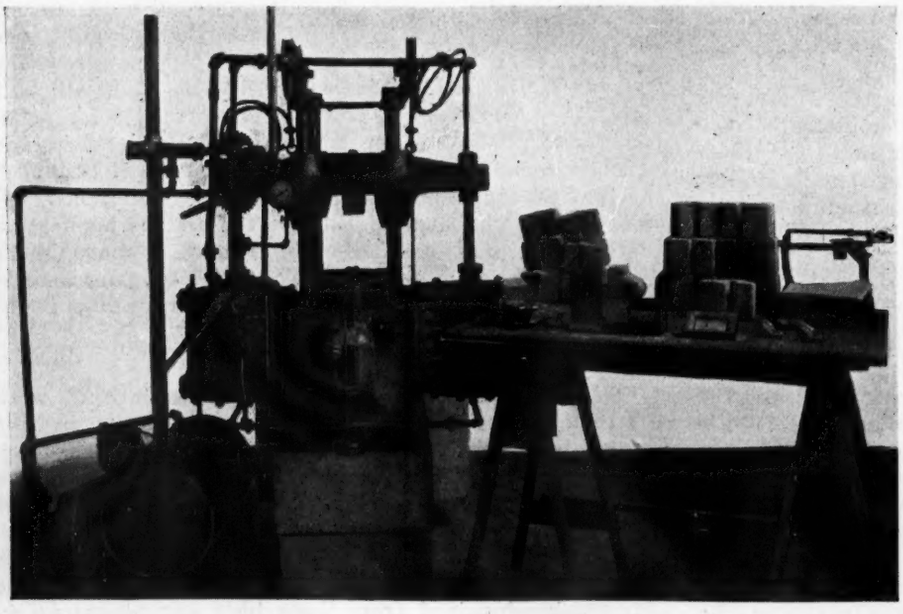
New samples are also tested in the chemical laboratory, in order to determine the specific gravity, the acetone extract and the amounts of free sulphur, zinc oxide, carbon and total fillers.

When the work of testing shackle blocks was first started, little data was available regarding the probable effects of service on blocks made of different compounds and by different processes. In order to obtain such data without waiting until sufficient service reports had accumulated, accelerate aging tests were conducted. There is said to be a definite relation between the deterioration of rubber in service at normal temperature and its more rapid deterioration at a much higher temperature, hence the results obtained in this accelerated aging test are regarded as a true criterion of what may be expected in regular service from the blocks tested.

Heat Supplants Time in Tests

Samples of blocks from different manufacturers were taken from the stock bins and subjected to the standard test referred to. These samples were cut up into smaller blocks with 2 and 2½-in. sides. The blocks were given a physical test, and one block from each original sample was then kept for a week in a room maintained at 160 deg. Fahr.

At the end of this period the blocks were subjected to a compression test. Another block from each of the original samples was then placed with the first and kept in the heated room for another week. At the end of this week the blocks were taken out and compression-tested, and a third lot was placed with them. The blocks were kept at a temperature of 160 deg. for a total period of 48 days, being taken out of the heating chamber for tests once every week. Quite a number of the samples failed at various stages of this test.



Machine for testing rubber shackle blocks

At the end of this period sufficient data had been accumulated to tell with a fair degree of accuracy which of the blocks would stand up in service and which would not, and the conclusions reached have since been verified by service results.

In the inspection department, where the service tests are conducted, records are made of the name of the manufacturer of each block tested, the date of reception and the date of cure, the compound code numbers and the number of blocks in the lot from

which the sample was taken. The dimensions are then checked by means of gages. Next a compression test of the sample is made in a fixture in a special machine as illustrated in Fig. 1. This is done in order to bring out any defects and to determine whether each block is of the proper hardness.

An inspection for cracks and other defects is then made on all blocks. About 10 per cent of the total number of blocks of each lot are tested for hardness and elasticity. The Shore instrument used for these tests can be seen on the bench at the right of the illustration and consists of an elastometer and a durometer. It may be mentioned here that when the number of rejections which are recorded seems too high, an occasional chemical analysis is made.

Referring to the illustration, the compression testing machine, built entirely in the Mack tool rooms, consists of a movable head counterbalanced by a weight (not shown), which is raised or lowered by admitting compressed air above or below the pistons of the cylinders located on each side of the machine. By a system of levers and links the load on the platen is registered on a standard scale beam in front of the machine. The control valves are so arranged that the application or release of the load can be very easily controlled.

When testing rectangular blocks, a flat plate is fastened to the under side of the movable head parallel to the platen and when shock insulators are tested, a casting, having the same inside shape and dimensions as the retaining cap of the standard rubber shackle housing, is fastened to the movable head; a steel block of the same size as the spring end is inserted in the rubber block itself, which rests in a casting also having the same dimensions as the housing cap, thus rendering all load conditions the same as in service.

Following is the sequence of the operations:

1. The free height of the shock insulator less the thickness of the spring opening is measured.
2. The block is placed in the fixture and the loads are applied until two and a half times the full service load is recorded (4 times for the smaller blocks). Its height after the load is applied is then gaged.
3. The load is released and the free height again remeasured.

Books on General and Specific Subjects

M. LUCKIESH, director of the Lighting Research Laboratory, National Lamp Works of the General Electric Co., has written a book entitled "Light and Work." In his preface the author says:

"Developments in the production and the utilization of artificial light have been so great in recent years that for the first time in the history of mankind we are encouraged to hope for lighting conditions in the near future which approach the ideal. . . . It was less than a score of years ago that artificial light first showed promise of being a formidable competitor of natural light indoors. Now this promise may be realized, because artificial light is not only a serious competitor of daylight on a cost basis, but is far superior from the viewpoint of control."

"The Lighting Value of Paint," which includes reflective factors of the various colors and is illustrated, constitutes the subject matter of one of his chapters. Another is on "Lighting and Production," with a glimpse of manufacturing statistics.

This volume is published by D. VanNostrand Co., 8 Warren Street, New York. Price, $4.

THE Electric Motor Truck, by Edward E. La Schum, General Superintendent of motor vehicle equipment of the American Express Co. and a member of the S. A. E., has just been published.

It is a book for the man about to venture into the trucking field or considering such a purchase for his own use, and all types of electric trucks are described for the purpose of helping the buyer to select the right one. In addition, motors, charging equipment and storage batteries are described, and for the truck owner there are systems and forms offered in detail for determining costs.

Admitting the normal, average range of an electric truck to be only thirty miles, the author goes on to show that within that distance it has no rival in economy and that it is the speediest means of delivery where stops are frequent and traffic congested. The writer is an authority on the subject, both from the standpoint of knowledge and practical everyday experience.

Thomas A. Edison says in a letter, of which a fac simile is reproduced in the book:

"I have found your book chock full of accurate information and sound reasoning. It can well be taken as a guide to the proper selection of motor vehicle equipment and its operation and maintenance."

Published by the U. P. C. Book Co., 239 West Thirty-ninth Street, New York. Price $4.

THE nineteenth addition of the French Universal Annual of the Automobile Industry for 1924 has just arrived. It is a thick volume, most of which is printed in French and is divided into six sections, listing:

1. French and foreign agents, trades and manufacturers of the automobile industry.
2. Directory of trades and callings, French and foreign, under an alphabetical index of towns.
3. Practical technical repertory, including interesting inventions of the year, explanations of terms, legislation on motor traffic and the like.
4. Lists of clubs, aero, motor car, etc.
5. On touring information on maps, guides and regulations.
6. Lexicon, French-English and English-French on usual and technical words and terms connected with motoring.

Published by "L'Annual," 222 Boulevard Pereire, Paris, France. The price is quoted as 25 francs and ten francs additional postage is required, a sum equivalent to approximately $7 normal exchange.

"POPULAR Research Narratives" offers two-minute stories of invention, discovery and research on a variety of subjects, including electric welding, radium, helium, tight flexible joints for submarine pipes, Bakelite and the like. More than that it is interestingly written. These brief tales have been collected by the Engineers' foundation of 29 West Thirty-ninth Street, New York, and may be obtained either from them or from the publishers, Williams & Wilkins Co., Baltimore, Md. The price is 50 cents.

Exports of Cars, Trucks and Tires for

COUNTRIES	GASOLINE PASSENGER CARS								GASOLINE TRUCKS					
	Up to $500		$500 to $800		$800 to $2000		Over $2000		Up to 1 ton incl.		1 to 2½ tons		Over 2½ tons	
	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value
Europe														
Austria					7	$6,224	2	$5,688						
Azores and Madeira Islands	1	$392	1	$685	1	1,568								
Belgium	61	23,188	40	26,276	53	58,243	17	48,732			1	$1,383		
Bulgaria					2	2,550								
Czechoslovakia	10	4,635	2	1,352	6	5,266								
Denmark			19	12,217	27	25,966	1	2,800						
Esthonia					1	832								
Finland	10	4,299	12	8,704	12	11,024	2	5,313	7	$4,333				
France					2	2,800	3	11,915						
Germany	25	10,437	18	13,645	187	193,377	4	9,391	2	2,067	2	3,159		
Gibraltar														
Greece	5	1,972	3	2,054	6	7,120	2	4,626						
Hungary	1	490			17	18,236								
Iceland and Faroe Islands														
Italy	557	156,078			1	1,000	4	15,054	158	40,662				
Latvia														
Malta, Gozo and Cyprus	4	1,584	1	756										
Netherlands	20	7,841	63	41,862	127	136,869	6	20,252	5	4,307				
Norway	30	10,671	26	18,860	16	15,991			4	1,755				
Poland and Danzig			3	2,258	1	1,337								
Portugal	3	1,066	1	756	13	15,287								
Rumania	12	4,752	4	3,088	6	7,321	2	4,626						
Russia														
Spain	62	25,128	78	56,899	247	258,474	11	32,638	2	2,067				
Sweden	21	8,340	140	93,925	248	239,106	1	2,100	31	32,146	9	10,352		
Switzerland	15	6,796	31	20,765	59	61,076	2	4,626						
Turkey					2	1,667								
Ukraine														
England	151	68,556	462	285,052	87	93,227	14	35,213	16	11,837	11	16,652		
Scotland														
Ireland	1	400	71	50,155	20	23,238								
Yugoslavia, Albania and Fiume					1	855								
North and South America														
United States														
Canada	83	30,335	377	249,050	459	498,419	35	121,652	57	51,810	157	205,000	16	$63,957
British Honduras	1	354	1	598										
Costa Rica	2	592	4	2,845							1	1,072		
Guatemala	1	304	16	11,194	12	14,281			3	1,044				
Honduras	2	708			3	2,900			6	2,120				
Nicaragua	3	1,092	6	4,364	3	3,493								
Panama	14	5,604	9	5,989	16	16,902			9	3,882	3	3,009		
Salvador	1	440			3	2,760								
Mexico	390	95,434	69	47,458	47	56,900	1	4,200	78	46,787	21	20,073	1	4,152
Newfoundland	3	875			3	3,404								
Barbados	2	624	1	736					6	2,136				
Jamaica	11	3,724	13	9,491	7	6,755	1	5,500	7	4,048				
Trinidad and Tobago	5	2,080	6	4,161	1	1,089	1	3,224	17	9,622	1	1,072		
Other British West Indies	3	1,264	1	600					5	2,611				
Cuba	654	195,145	97	67,011	58	69,582	16	41,569	97	31,604	1	2,692		
Dominican Republic	86	29,939	6	4,300	10	11,696	1	2,061	7	2,492	2	1,514	2	5,430
Dutch West Indies	6	2,597			2	2,758			6	2,434				
French West Indies														
Haiti	4	1,509	7	4,879	5	6,009	1	2,400	4	1,424				
Virgin Islands			1	746	1	1,196								
Argentina	690	305,185	388	248,559	216	215,799	27	67,890	17	30,028			14	35,509
Bolivia			1	758	10	11,879			1	440				
Brazil	106	32,821	85	57,919	116	111,423	10	26,207	20	4,859	2	7,600		
Chile	88	22,193	8	5,336	40	52,212	2	5,965	112	35,105	23	27,588		
Colombia	22	7,876	8	5,646	11	11,267	1	2,374	9	6,003	1	847		
Ecuador	2	900	1	572					2	904				
British Guiana	6	2,184												
Dutch Guiana														
Paraguay														
Peru	44	16,133	46	32,150	40	40,367			37	19,854	16	19,247		
Uruguay	256	81,990	39	22,383	46	47,517	4	9,400	82	23,389				
Venezuela	114	43,968	16	11,392	22	22,005	5	12,375	57	20,644	1	1,480		
Asia														
Aden														
British India	106	46,762	81	57,744	32	32,754			6	4,750	8	9,300	2	4,000
Ceylon	13	5,654	10	6,473	18	20,285			17	15,554	9	11,620		
Straits Settlements	56	25,268	9	6,412	16	16,975								
China	9	3,770	33	22,781	30	33,532	1	2,009	1	530	1	1,034		
Chosen														
Java and Madura	18	8,189	71	50,353	54	55,150								
Other Dutch East Indies	5	2,347			8	7,556								
French Indo China														
Hejaz, Arabia and Iraq	5	1,068			3	2,717								
Hongkong			2	1,424	1	1,601			1	500	4	6,749		
Japan	618	206,743	178	110,065	223	260,726	16	47,033	731	257,007	21	44,472	9	30,826
Kwangtung	20	7,280	6	3,708	2	2,614			20	7,360				
Palestine and Syria	30	10,680	2	1,512	8	8,868	1	2,309						
Persia	10	3,560												
Philippine Islands	105	38,350	52	36,815	36	36,797	4	10,720	42	18,172	4	4,526		
Russia														
Siam			9	6,018	1	801								
Turkey														
Other Asia														
Oceania														
Australia	958	367,120	1,271	815,899	794	832,284	27	67,147	96	107,195	31	42,641	20	47,890
New Zealand	24	10,336	182	126,584	152	167,189	7	21,726	23	31,152	13	15,232	8	23,440
Other British Oceania														
Other Oceania														
Africa														
Belgian Congo														
British West Africa	3	1,462	6	4,628	7	7,078			43	42,258	13	13,380		
British South Africa	16	7,153	217	146,807	171	171,644	3	7,634	18	14,965			1	4,200
British East Africa	14	4,796	11	8,221	5	5,142			2	970				
Canary Islands	2	792	2	1,405	4	5,448			2	1,792				
Egypt	5	2,290	13	9,320	2	2,472								
Algeria and Tunis	1	364							3	1,224				
Other French Africa	1	312							8	2,444				
Morocco														
Portuguese East Africa			2	1,392					1	1,008				
Other Portuguese Africa	7	3,608	1	600					19	7,325				
Spanish Africa														
Total	5,614	$1,979,799	4,339	$2,855,607	3,847	$4,070,900	235	$666,369	1,897	$916,620	359	$471,694	73	$219,204

March, 1924 | Canadian Exports

ELECTRIC VEHICLES		PARTS	TIRES						PASSENGER CARS		TRUCKS		PARTS	COUNTRIES
			Casings		Inner		Solid							
No.	Value	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	Value	
														Europe
		$310												Austria
		269	48	$528	72	$108								Azores and Madeira Islands
		1,426,653	265	5,447	12	72	6	$383	17	$14,730			$1,112	Belgium
		1,061												Bulgaria
		611												Czechoslovakia
		1,176,603	9,550	92,103	9,080	11,557	188	6,161	3	3,875			69,677	Denmark
		12	43	1,185										Esthonia
		1,620	956	12,822	1,034	2,086			15	9,948				Finland
		532,329	47	1,736										France
		3,248	6	90					24	19,516				Germany
		22												Gibraltar
		3,504	115	977	75	101	1	23	2	945				Greece
			164	2,641	250	500			7	9,019				Hungary
		184												Iceland and Faroe Islands
		84,220	1,441	15,750	1,388	2,562								Italy
			130	1,459	90	154								Latvia
		659	20	199					8	3,555				Malta, Gozo and Cyprus
		23,454	1,269	16,082	885	2,729	50	1,374	18	23,394			105	Netherlands
		23,848	2,020	29,761	2,129	3,633	58	2,286	15	15,568			190	Norway
		776							24	21,662				Poland and Danzig
		3,431	736	8,654	2,906	5,525								Portugal
		359												Rumania
		3,634	20	152	40	50								Russia
		200,596	469	14,351	172	624	203	7,420					22,296	Spain
		31,586	2,284	29,833	1,889	3,200	148	6,164	89	81,783			55	Sweden
		4,491	666	8,423	498	850			26	21,400				Switzerland
		1,456							10	4,441				Turkey
		352	66	1,901	16	30								Ukraine
		431,155	20,826	171,809	17,513	18,299	2,779	63,771	910	584,557	144	47,310	87,593	England
		2,277	112	1,388	200	234	353	8,683						Scotland
		11,239	40	343	113	189								Ireland
		30												Yugoslavia, Albania and Fiume
														North and South America
													10,639	United States
19	$27,737	2,550,629	7,041	84,545	2,981	8,468	534	25,340	3	7,150				Canada
		280	2	80	2	10								British Honduras
		4,443	95	1,361	60	107			1	1,358			36	Costa Rica
		2,492	189	3,441	286	541			5	5,308				Guatemala
		2,195	20	503	16	40	18	857						Honduras
		127	8	72	135	216								Nicaragua
9	11,142	7,709	931	12,226	1,306	2,404	4	166	1	1,271				Panama
		1,679	254	5,254	274	710			6	7,573				Salvador
		71,209	4,098	56,378	4,954	13,245	49	1,212	13	11,115				Mexico
		3,410	269	3,893	405	751	4	142						Newfoundland
		1,950	47	372	35	53	12	300	9	4,470			74	Barbados
		10,156	305	3,938	198	397	17	288					97	Jamaica
		7,874	213	2,436	68	105	18	595					559	Trinidad and Tobago
		2,883	22	408	39	54			1	1,261			112	Other British West Indies
		127,368	8,703	92,811	14,310	21,324	764	25,025	3	3,691	3	6,800	16	Cuba
		7,817	1,212	12,855	945	1,681	48	1,177	3	1,418				Dominican Republic
		1,099	346	2,989	394	576			1	603				Dutch West Indies
		355	7	119										French West Indies
		2,843	137	2,005	165	360			1	851			31	Haiti
		516	19	203	25	50								Virg'n Islands
		597,454	6,958	80,992	7,060	9,251	110	4,217	184	149,758			47,525	Argentina
		4,268	8	191	4	10			2	1,893				Bolivia
		458,460	3,844	45,457	90	134	5	139	35	39,232			37,684	Brazil
		29,173	818	13,422	884	1,791	63	2,651	1	1,126				Chile
		16,165	621	8,283	1,089	1,973	34	1,629	9	11,138			71	Colombia
		1,162	130	2,488	110	261			8	10,547				Ecuador
		6,688	4	255	10	37			3	2,032			48	British Guiana
		229	29	317	16	29							33	Dutch Guiana
			12	97										Paraguay
		28,280	1,788	24,835	2,094	3,947	41	1,435	1	634				Peru
		7,287	717	8,673	641	990	10	170	22	24,442			100	Uruguay
		9,446	1,370	14,400	1,415	2,418	28	673	4	3,782				Venezuela
														Asia
		153	55	604	90	120					8	2,608	2,061	Aden
2	5,147	33,695	1,443	15,021	971	3,247	156	4,722	584	234,367	148	51,509	27,965	British India
		6,811	141	1,346	12	81	4	52	83	39,951	70	24,304	7,283	Ceylon
		32,537	625	6,370	475	538	66	1,666	145	73,124	24	7,824	22,644	Straits Settlements
		16,378	1,037	14,677	793	1,324	9	228	22	18,051				China
		9,044												Chosen
		9,973	291	6,240	702	1,655	231	5,153	90	45,319	24	8,037	8,229	Java and Madura
		5,316	24	263	50	102	88	1,892						Other Dutch East Indies
		5,049												French Indo China
		3,086												Hejaz, Arabia and Iroquois
		3,391	89	1,489	41	65			16	17,983				Hongkong
2	1,350	108,754	6,611	67,924	6,501	12,079	2,549	41,098	13	8,100				Japan
		3,504	130	1,256	169	283								Kwantung
		3,934	147	2,030	177	308							26	Palestine and Syria
														Persia
		21,741	3,355	43,299	2,467	5,201	906	15,005						Philippine Islands
														Russia
		692	102	990	78	108	4	116	15	5,122	30	9,780	2,568	Siam
		876												Turkey
		1,583												Other Asia
														Oceania
		178,501	2,757	33,658	2,744	5,364	1,268	36,763	2,558	772,577	1,342	439,172	161,491	Australia
		63,522	2,069	32,799	2,141	3,739	299	13,698	1,014	513,811	192	66,654	51,035	New Zealand
		445	7	134					2	668	1	378	1,340	Other British Oceania
		696	10	135	20	35								Other Oceania
														Africa
		662												Belgian Congo
		11,152	272	4,540	306	695			32	8,676	27	8,802	4,940	British West Africa
		24,755	533	6,702	164	289	14	476	379	225,218	60	18,818	125,183	British South Africa
		10,459	372	3,936	355	551	19	814	37	12,056	14	4,564	4,278	British East Africa
		7,279	211	2,821	169	219	46	972						Canary Islands
		6,228	345	2,399	330	363	37	922						Egypt
		82												Algeria and Tunis
		2,868							1	334	2	652		Other French Africa
		458												Morocco
		207	80	2,260	166	738			2	1,658				Portuguese East Africa
		664	24	375	44	96								Other Portuguese Africa
							6	117						Spanish Africa
32	$45,376	$8,510,130	102,240	$1,154,201	97,338	$161,636	11,247	$285,975	6,477	$3,082,061	2,089	$697,212	$697,096	Total

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Basic Conditions Sound

REPORTS indicate that car and truck manufacturers are in excellent condition to go through the period of adjustment which has become necessary at the present time. Factories are not burdened with excessive stocks of cars nor are heavy inventories on hand. Dealers in a few lines have a large number of vehicles on the floor of their showrooms, but in general are not being asked to carry more cars than they reasonably can expect to sell in the next month or so.

Consequently, basic conditions are sound, despite a further decrease in production for May. The number of cars shipped from the factories this May is somewhat below the April total and considerably lower than that of May a year ago. Parts makers report a good many deferred orders but relatively few cancellations.

The necessary replacements of scrapped cars and the caution with which practically every manufacturer has operated during recent months make it almost certain that 1924 will yield fair profits. Those who looked for new production records will be disappointed, but most executives feel that there is no real cause for worry at the present time.

With production totalling about 160,000 for the first five months of the current year, the truck branch of the industry is in relatively good condition.

Its production exceeds that of the first five months of 1923 by a fair margin. This growth has been brought about by the demand for light trucks. There has been a slight recession in the demand for heavy trucks.

Parts makers report that truck builders are taking their commitments promptly and are using the material purchased.

Having realized six weeks back that caution in production was necessary because of abnormal conditions, passenger car makers now are prepared to take conditions as they find them in the next month or so. It is expected that June, which usually is a bumper month, probably will be a comparatively slow one in production.

The "Death" Ray

THE daily papers continue to give considerable attention to the so-called death rays or devil's rays, by means of which it is claimed to be possible to stop the ignition of an internal combustion engine from a distance. While the earliest developments along these lines were reported from Germany and France, the most recent claims to the discovery come from England.

One rather remarkable thing in connection with these rays is that they should have been discovered successively in three different countries within a period of a few months. The scope of the claims has gradually decreased, for whereas in Bavaria airplanes were said to have been brought down with the aid of these mysterious rays, in Paris the demonstration consisted in stopping a taxicab motor in the street from the balcony of an adjoining house, and the English discoverer, still more modest, claims only the stopping of an engine in the laboratory at a distance of a few feet from the source of the rays.

It is interesting in this connection to note that the British Government, to which the invention was offered for a consideration, has maintained a very skeptical attitude and refused to enter into negotiations with the "discoverer" unless he can first show certain definite results. One of the conditions insisted upon by the Government is that the "discoverer" stop an engine under the care of Government engineers, which may be much more difficult than stopping one specially prepared by himself.

The present discussion reminds one strongly of the Keely motor, exploited in Philadelphia in the nineties and which was operated, according to the inventor, by the "twin-polar stream of negative attraction." The motor was located under a glass dome or cover, into which led tiny wires supposed to conduct the "twin-polar stream"; no one was allowed to disturb the cover, and it was only after Keely's death that it was discovered that the tiny wires were in reality tubes which led to a compressed air plant in the basement.

It would be easy enough to stop the ignition of an airplane engine from the ground if the plane were specially prepared for the feat, if it had a receiving apparatus with provisions for multiplying the effects produced directly by the rays or other means of transmission, by energy from a source carried on board. The whole object, however, is to provide means for stopping the ignition not with the cooperation of the people in charge of the plane or engine, but in spite of whatever they may do to prevent it.

In the present state of knowledge the only possible way of interfering with an electric ignition system from a distance seems to be by means of magnetic or electrostatic induction, and it is inconceivable that stronger inductive effects could be produced on the circuits of the ignition system from a distance of a mile or more than with means carried directly on the plane. Of course, more powerful sources of energy could be provided on the ground, but the handicap due to the greater distance makes it seem absolutely impossible to overpower the inductive effects produced locally.

Even if it should be found possible to interfere with an ordinary ignition system from a distance, that would be of little consequence so far as the use of automotive equipment in military operations is concerned, for there would remain the possibilities of insulating the whole ignition apparatus against the inductive effects (by means of a copper shell, for instance) and of using non-electric ignition systems, such as the hot tube or hot bulb system.

Helping Dealers in Service Work

ONLY in recent years have manufacturers been taking an active interest in service station equipment. Today practically every car builder is studying various types of garage tools to a greater or less extent; some are going into the question in very great detail and are recommending specific equipment for purchase by the dealer.

From a technical standpoint, the manufacturer undoubtedly can help his dealers considerably by such investigations. The method used in making recommendations, however, should be studied carefully before a permanent plan is adopted. A slight difference in method may make quite a large difference in the working out of the idea.

There should be someone in the factory organization, capable of passing judgment on the adaptability of any given tool. It is not advisable to turn over the final word on such matters to an outside organization. Such organizations can and are rendering a real service to the manufacturer at the present time, but their efforts should be checked carefully by the factory organization.

It is good policy for the manufacturer to recommend more than a single make of tool for each particular job that the dealer may have the advantage of selecting the particular make which he considers best suited to his shop and which he can get delivered at the time he wants it.

When a line of approved tools—one make of each type—is presented to the dealer, the possibility exists of the list being influenced by the discount offered on the tool. When several makes of each type are recommended the influence of such factors is reduced materially.

Minimize Lumber Waste

IN our issue of April 17, 1924, under the heading "Ford Upsets Precedents in Interest of Lumber Conservation," we told how, by sawing body parts from unedged boards, thus using the swell of the butt and even branches not less than 4 in. in diameter, Ford had effected savings said to amount to 35 to 50 per cent.

Continuing, the article said, "It would be a conservation measure of national importance if saw mill operators, instead of sawing boards, would saw complete parts or dimensional stock. Automobile body companies, furniture factories and other wood working industries could have their parts made right at the mill, thus making an enormous saving in lumber, in addition to which they would profit by lower freight rates."

Apparently this idea doesn't appeal to some lumber men at all. In any case, certain of their representatives are credited with the statement that the procedure recommended is not new, since it has been used for years by chair manufacturing plants, and that unedged boards are not a commercial commodity, anyhow, because of difficulty in measuring them and the virtual impossibility of grading them properly.

Both of these contentions are, of course, entirely beside the point. No one is disposed to detract any credit from chair manufacturers or others who may have initiated the practice referred to and found it so economical as to continue it for years past. Neither is it proposed to make the unedged board a commercial commodity. The board, if ultimately to be cut into small pieces for quantity production of bodies, never should leave the mill until it is so cut into parts of the size and shape in which they are to be used.

This would result, not only in getting more and frequently better pieces from a given log, but in shipping only that portion of the tree which finds its way into the finished automobile body. By so doing waste is minimized, nobody pays freight on the waste, while the profits of the middle man, who, of course, prefers to sell finished boards, are eliminated.

Direct savings to the automotive industry are important, but in the end the indirect saving which will result from the intelligent use and conservation of the nation's lumber supply well may prove of even greater importance.

NOW that the President has signed the tax bill the mind of business is at rest concerning the piece of legislation of most importance to industrial progress. It looks as though debate on the agricultural and railroad bills will not be completed during the present session, so that the track seems to be clear for the time being so far as concerns political action relating to business.

DEALER REPORTS OF MAY SALES VARY

CORRESPONDENTS of Automotive Industries in the chief distributing centers of the country have gathered reports from dealers and distributors showing sales conditions in their territories during the month of May.

Brief summaries of these reports are given on this page and subsequent pages of this issue.

New York

NEW YORK, June 4—With but few exceptions metropolitan dealers report that May showed a falling off in retail business as compared with the same month a year ago. It looks as if June will be correspondingly slow, although it is believed that the first of July, when new models are expected to be announced, will see a pick-up.

Registrations for the first half of May were about on a par with April, but in the last fortnight fell away. This is a definite departure from the pace maintained in the first four months of this year, when the registration barometer disclosed that in the metropolitan district sales ran considerably in excess of the same period in 1923. The increase, however, has been in the class under $2,000, the division above that showing a falling off from the count of 1923.

Certain lines are holding up, though, one of those in the higher priced class reporting an increase over April, but this was the exception rather than the rule. Some of the representatives of this line are frank to state that a year ago this time saw better business.

Used cars are reported to be moving fairly well and the anticipated increases in list prices do not seem to have helped the present market.

Chicago

CHICAGO, June 4—May business for automobile dealers in Chicago failed to take the brace anticipated 30 days ago. The popular complaint is that business for the month was off, as compared with May of last year, and in some instances even lower than April of the present year.

Dealers for the most part place their respective declines from small percentages to 50 per cent. The price of the car does not seem to enter the situation, some of the popular low-priced lines being hit as hard as higher priced cars. Bright sunshine of the last few days, however, seems to have had a stimulating effect in certain corners of the trade.

Occasionally a dealer is found who claims improved business in May. One medium price dealer says he is running about 30 per cent ahead of last year, with May about 30 per cent ahead of the preceding May. Another who had a good business in April says he ran about 30 per cent ahead in May, compared with May, last year. Still another handling cars of about the same price ventured that a balance of May's books will show May to have been the biggest month in the company's history.

The situation here is not without its bright spots. There is no effort, though, to conceal the fact that business, on the whole, has been far from satisfactory, and that with the decline there has been a proportional falling off in profits.

There is difference of opinion as to what the total effect of any extensive price raising would have. While some Chicago dealers think it would have a good influence, others believe it would not serve as a tonic to business, which already is contending with considerable sales-resistance.

Birmingham

BIRMINGHAM, ALA., June 4—The automobile business in Birmingham is from 15 to 20 per cent under last year. Dealers who are handling the lower-priced cars state that business in their lines is nearly normal, but those handling the higher priced makes find sales slow.

There are a great many calls for trade-ins. Local dealers are not going in for the trade-in sales as much this year as they did last, and for that reason the sales that are made have bigger profits. This policy has been the saving of the business so far, for it has kept the dealers from getting their profits tied up in used cars.

On the whole the dealers say that, while sales are fewer, the profits on each sale are better. Much of the reduction in the gross business is traceable to the frequent refusal of Birmingham dealers to make trades where a used car is involved. Not all of the decline is due to that cause, however. This spring has just naturally been slower for automobiles than the spring of 1923.

Dallas

DALLAS, TEX., June 4—A decrease in the retail sales of new automobiles in Texas was evident during May as compared with April and March. Dallas sales decreased 5 per cent, Houston about the same, Fort Worth 7 per cent, San Antonio 4 per cent and Wichita Falls, Galveston, Amarillo, Beaumont, Waco and Temple about 10 to 12 per cent when compared with April. The sales of used cars were about the same as for the preceding month.

Money was getting tighter in most sections of the State during May. Farmers were not spending, neither were they buying cars.

(*Conditions in other cities on page* 1245)

All Lines of Business Declined in April, Reserve Bank Says

CHICAGO, June 4—In its monthly report on business conditions in the Seventh Federal Reserve District the Federal Reserve Bank of Chicago makes the following comment with respect to April's automotive business:

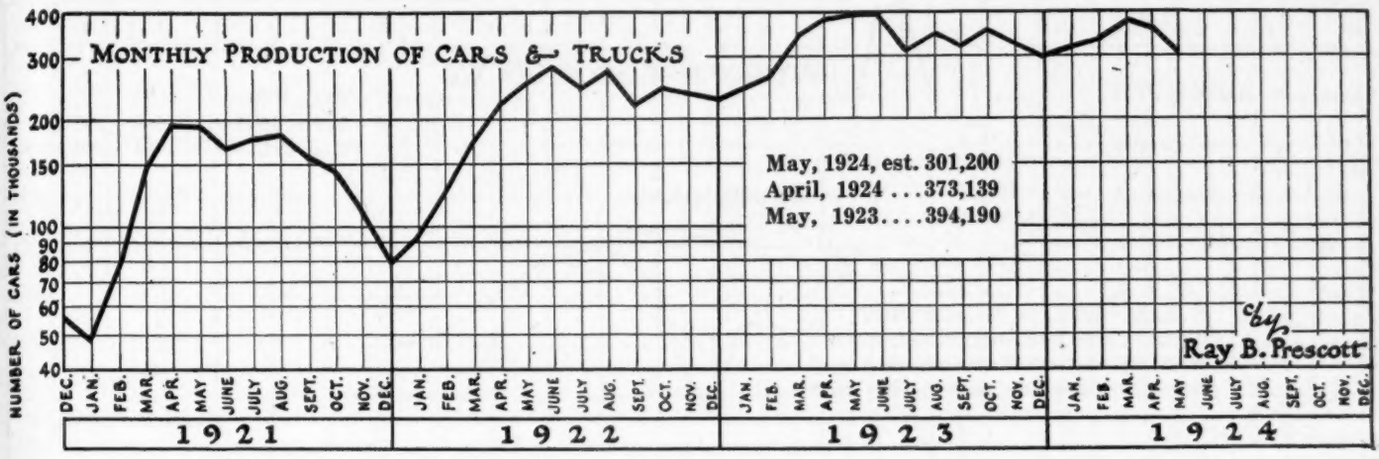
"With the April curtailment of production and shipments smaller than in March, stocks of cars in dealers' hands and in warehouses were withdrawn in response to retail demand, which showed a marked improvement over March. Reports received by this bank from warehouses in Chicago indicate a fair movement of cars to consumers, but the number of cars still held is in excess of those held a year ago, although replacements have fallen off.

"Distributors and dealers in the Middle West report gains in the wholesale and retail distribution of new cars during April compared with the preceding month and April a year ago, resulting in a smaller number of new cars on hand April 30 compared with March 31, although there was a gain compared with a year ago, at which time dealers were experiencing difficulties in receiving new stocks.

"Used car sales also increased compared with the previous month and year, while the number on hand April 30 decreased from March 31 but continued at a higher level than a year ago. Used cars on hand April 30 represented 111 per cent of the total April used car sales."

In speaking of industrial employment conditions in this reserve district the monthly report of the Chicago bank notes that "there was a noticeable lack during April of the usual acceleration of activity within the manufacturing industries of this district. A slowing down in practically all industrial lines was found," emphasizing a contrast with conditions of a year ago when manufacturers were having difficulty in obtaining necessary labor for their requirements.

ESTIMATES PUT MAY OUTPUT AT 301,200



Total for 5 Months Is 6 Per Cent More Than That for 1923

NEW YORK, June 4.—Shipping figures compiled by the National Automobile Chamber of Commerce place May production of cars and trucks at 301,200, a total in keeping with the predictions which had been made during the month just ended. The figures are 19 per cent below the revised figures of 373,139 for April of this year and 23 per cent under the record breaking month of May, 1923, when the industry turned out 394,190.

The total this May, however, was sufficiently large to enable the industry to show a gain for the first five months of 1924 over the corresponding period of 1923, the count being 1,749,543 as against 1,652,518, an increase of 6 per cent.

An analysis of the returns, based on the May total, shows that the industry still is running at a more than normal pace in the matter of production. When the peak production of 394,088 was reached in May of last year, the statisticians figured that this was 50 per cent ahead of normal, while this May is 30 per cent better than what would be produced under normal conditions.

With conditions as they are, it is declared that there now lies ahead a period of readjustment to balance sales and production so that cars now in dealers hands may be absorbed. This is not an alarming situation. That present stocks, although admittedly large, will not last long, given good weather, is predicted.

June, it is expected, will see another drop in production, brought about by factories slowing down in preparation for the introduction of new models.

PRODUCTION LAST MONTH SHOWED A DROP OF 19 PER CENT FROM APRIL AND 23 PER CENT FROM TOTAL OF PREVIOUS MAY

NEW YORK, June 4—Shipping figures received by the National Automobile Chamber of Commerce place May production at 301,200 cars and trucks, a decrease of 19 per cent from April, 1924, and 23 per cent under May, 1923.

The following table gives the statistics for the first five months of 1923 and 1924:

	Output		Carloads		Driveaways		Boat	
	1924	1923	1924	1923	1924	1923	1924	1923
January	316,224	243,554	46,559	35,223	40.976	30,031	1,018	728
February	376,524	276,955	49,219	36,165	48,300	43,613	1,100	882
March	382,456	355,073	54,286	44,983	41,545	62,988	500	1,908
April	373,139	382,746	49,400	46,095	36,628	60,467	4,056	5,027
May	*301,200	394,190	.....	45,095	.....	62,346	....	12,812

Factory shipments and output for the other months of 1923 and 1922 follow:

	Output		Carloads		Driveaways		Boat	
	1923	1922	1923	1922	1923	1922	1923	1922
June	378,575	289,407	40,281	34,230	59,099	33,857	13,492	7,737
July	328,063	247,186	32,623	29,116	46,837	28,100	10,131	7,030
August	345,271	274,209	38,319	32,817	45,958	36,768	10,053	10,104
September	327,506	207,206	35,986	26,335	39,653	30,177	8,463	8,118
October	365,162	239,406	42,236	27,100	37,947	35,203	7,663	7,605
November	312,996	237,329	38,133	27,232	32,859	27,376	6,413	5,070
December	303,201	228,410	34,984	27,244	27,608	26,743	4,000	1,307

Motor Vehicle production segregated as to cars and trucks is as follows:

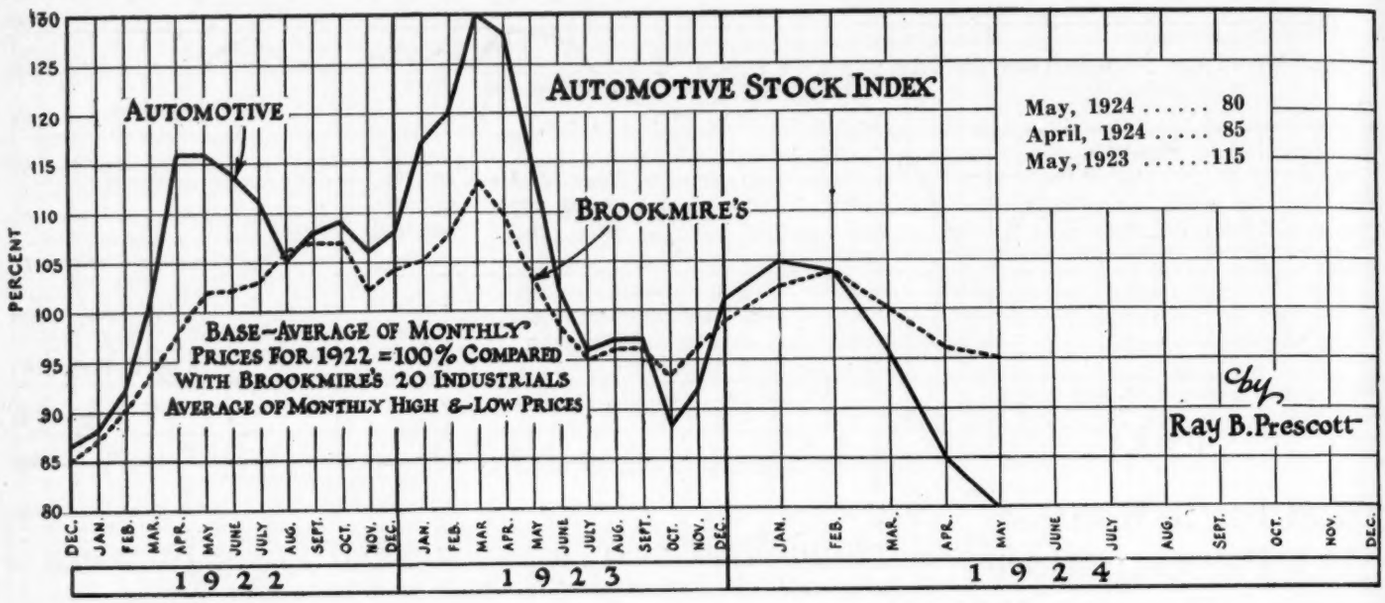
	1923	
	Cars	Trucks
January	223,822	19,732
February	254,782	22,173
March	319,789	35,284
April	344,661	38,085
May	350,460	43,730
June	337,402	41,173
July	297,371	30,692
August	314,399	30,872
September	299,928	28,578
October	335,023	30,139
November	284,923	28,073
December	275,439	27,762
1924		
January	287,302	28,922
February	336,373	31,151
March	348,350	34,106
April	337,037	36,102
May	*271,200	*30,000

* Estimated.

OLDS DEALERS ON INCREASE

DETROIT, June 2—Olds Motor Works reports a continued increase in the number of its dealers, the present total of about 2200 direct and 250 additional associate dealers being augmented at a rate approximating six or more a day. The majority of new dealers have been placed in the rural sections of the country where a heavy demand for the new car is being experienced, the factory declares.

AUTOMOTIVE STOCKS CONTINUE DECLINE



Automotive stocks showed a further decline last month because of the slowing up in automobile production. Quotations show a fall of 30 per cent below May, 1923

New York Exchange

	Apr. 1	Apr. 28	May 29
Ajax Rubber	6¾	6	5¾
American Bosch	26½	24¾	22¾
American-La France	10½	10¾	10
American-La France pfd.	..	96	91
Case, J. I.	..	⅝	16
Case, J. I., pfd.	49	..	45½
Chandler	48⅞	47	45
Continental Motors	6⅞	6½	6⅛
Eaton Axle & Spring	17	17½	15
Electric Storage Battery	57	57	54¼
Emerson-Brantingham	1½	..	1
Emerson-Branting'm, pfd.	10	..	7½
Fisher Body	205½	209	171
Fisher Body pfd	99	99½	99
Fisk Tire	7¼	6½	6½
Fisk Tire pfd	54½	47½	42¼
Gardner	..	5	3¾
General Motors	14¼	14	12⅞
General Motors pfd	..	83	80
General Motors 6%	81¾	83	80
General Motors 7%	95	97½	90
Goodrich, B. F.	20¼	20½	19¼
Goodrich, B. F. pfd.	71¼	72	72
Goodyear Tire pfd.	43⅛	42⅝	42½
Goodyear Tire pf. pfd.	90	91½	89⅛
Gray & Davis	5¼	4¾	4¼
Hudson Motor Co	26¼	23⅞	23⅝
Hupp Motor	13⅝	12⅞	12
Indian Motorcycle	19½	20½	18½
International Harvester	83	85	84
Int. Harvester pfd.	..	107	108½
Kelly-S Tire	17	15⅝	13⅜
Kelly-S Tire 6% pfd.	55	52½	40
Kelly-S Tire 8% pfd.	45¾	51	41½
Kelsey Wheel	86	81	78
Kelsey Wheel pfd	..	..	102
Keystone Tire	2	2	1⅝
Lee Rubber	11¾	10⅝	8½
Mack Truck	81	81	80⅛
Mack Truck 1st pfd.	96¼	..	97
Mack Truck 2nd pfd.	88	87	88¾
Marlin-Rockwell	12¼	11½	9⅛
Martin-Perry	35	35½	30½
Maxwell Motors A	43⅝	42¾	41½
Maxwell Motors B	11⅞	11¾	10⅛
Moon Motors	23⅛	20½	19
Mullins Body	10	..	11
Mullins pfd.	..	..	..
Nash Motors	100¾	100¾	99¼
Nash Motors pfd.	99¾	99	98½
Ohio Body & Blower	1¾	..	1⅛
Packard	10½	10	10⅜
Packard pfd.	93¼	89½	92
Parish & Bingham	14⅞	15¼	13
Pierce-Arrow	8⅞	8⅛	6¾
Pierce-Arrow pfd.	21½	21½	18½
Pierce-Arrow pf. pfd.	43¾	..	59
Reynolds Spring	15	14⅞	11
Spicer Mfg. Co.	13	12	9¼
Spicer Mfg. Co. pfd.	85	..	80
Stewart-Warner	77½	73¾	59
Stromberg Carburetor	64½	64	59
Studebaker	93¼	85⅞	32⅝
Studebaker pfd.	111	..	110
Timken Roller Bearing	36	34⅞	34
U. S. Rubber	30¼	29⅜	24⅞
U. S. Rubber 1st pfd.	79½	79	69

Denver

Auto Body Com.	..	1¼	..
Columbia Motors	½	9/16	7/16
C. G. Spring Co.	7	5⅛	..
C. G. Spring Co. pfd.	6	6	..
Continental Motors	6⅞	6¼	6⅜
Edmunds & Jones	39	34	33
Edmunds & Jones pfd.	92½	..	..
Federal Truck	22	..	..
Ford of Canada	455	448	426
Gen. Al. & Brass Mfg. Co.	14¼	13¼	11¼
Hayes Mfg. Co.	1⅞	1¾	..
Motor Products	65	..	..
Motor Products pfd.	48½	..	..
Motor Wheel	9½	9	8¾
Packard com.	10¼	10⅛	10⅛
Packard pfd.	93¼	..	91
Paige-Detroit	15	13⅝	12¼
Reo	16⅛	17⅛	15⅞
Timken Axle com.	5	5½	4⅞
Timken-D Axle pfd.	..	75	..

Chicago

Bassick Alemite	32½	30½	30¼
Borg & Beck	..	24¼	21¾
Continental Motors	6¾	6½	6¼
Earl Motors	..	..	..
Eaton Axle & Spring	..	..	..
Gill Mfg. Co.	..	..	6
Hayes Wheel	..	..	..
Hupp	..	12½	11¾
McCord	32	..	33
Reo	16⅛	..	16
Reynolds Spring	..	..	..
Stewart-Warner	77¼	72⅞	60½
Yellow Mfg. Co.	81¾	57	46¾

Philadelphia

Electric Storage Battery	58	57	54¼

Cleveland

Firestone	68	66	...
Firestone 6%	96	93½	96
Firestone 7%	87	86	88½
Goodyear	10	10	10
Goodyear pfd.	..	42	..
Jordan pfd.	..	90	91
Miller Rubber	65	61	65
Miller Rubber pfd.	97	97	93
Peerless Motors	18¼	20	18⅝
Stearns F. B.	15	14¼	14

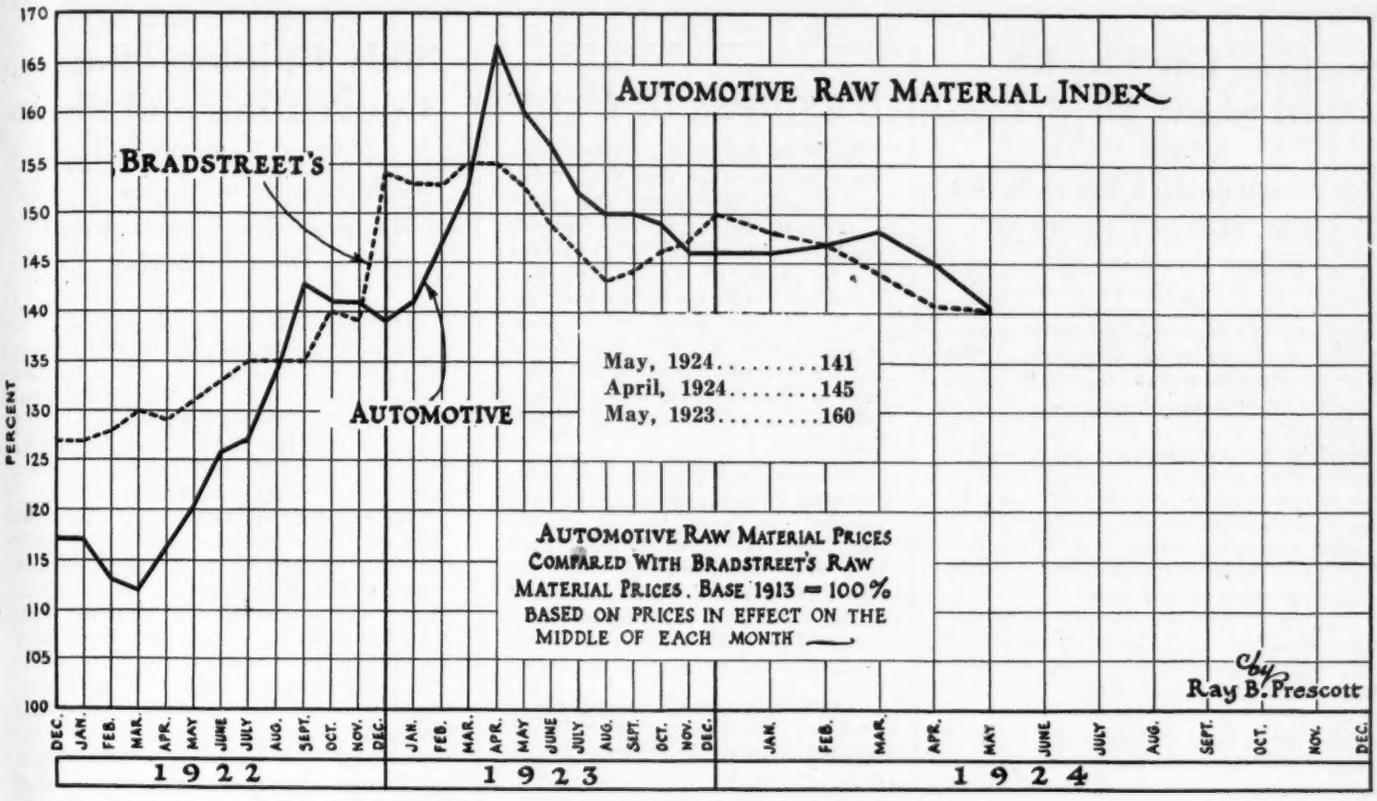
Boston

Gray & Davis	..	4¾	4
Greenfield Tap & Die	13¾	14	13¼
Hood Rubber	46	..	47
General Motors	..	..	..
Fisk Rubber	..	..	..

New York Curb

Bassick Alemite	32½	..	..
Cleveland Motors	19¼	18	17
Durant Motors	20¾	18½	15½
Durant Motors of Ind.	..	..	..
Dupont Motors	1	..	2¾
Edmunds & Jones	..	..	..
Ford of Canada	456½	454	425
Goodyear Tire & Rubber	10	10	10
Hudson pfd.	20⅞	26	31½
Jordan Motor Car	26½	..	..
Motor Products pfd.	..	47½	..
Motor Products Corp.	..	..	..
Paige-Detroit	15½	13¼	12¼
Peerless	19	20	18
Reo	16¼	17¼	16
Stutz Motors	8	8	7
Standard Motors	2⅞	2½	..
Timken-D Axle	..	5⅜	4¾

COST OF RAW MATERIALS AGAIN DROPS



The drop in raw material prices is due to the curtailment of automobile production and the easing off of demand in other lines using the same materials. It represents a decline of 12 per cent from May, 1923

Cotton Prices and Better Weather Are Factors in South

Louisville

LOUISVILLE, KY., June 4—Business among automobile dealers in Louisville dropped off about 20 per cent during May, as compared with April. Some dealers report it as high as 25 per cent. There are a few, about one dealer out of every ten, who still hold that business is "good." It is unmistakable, however, that retail sales are decidedly off in the Kentucky metropolis. This is true when the current month is compared with last month and also with May of last year.

It is interesting to note the statistics in the various price fields. While complete figures for May are not available, the percentages are about as follows: Low priced car sales are 10 per cent behind the record of May, 1923, and 25 per cent behind April of this year. Medium priced cars are running 25 per cent behind May, 1923, and 15 per cent behind April, this year. In the high priced field sales will show up about equal to April, but 25 per cent behind May, 1923.

The outstanding feature, therefore, is the comparatively fine showing of the low-priced makes in April of this year, which was considerably in the lead of April, 1923, and hence makes May this year show up poor.

Delayed opening of warm, bright weather is the explanation given in Louisville of the unfavorable showing of sales during the present month.

Atlanta

ATLANTA, GA., June 4—A marked betterment in the volume of automobile and truck sales during May, as compared with April, is reported by the dealers and distributors in Atlanta and the adjacent territory. The volume of business, however, is still less than the dealers had looked for earlier in the season, and not yet up to the total sales the trade was experiencing at this time a year ago, with the exception of lower priced cars.

The latter are selling on a satisfactory basis all over the district, principally in rural communities, and there has been little abatement since the early part of the year. Higher priced cars, however, still are slow, but a much more active demand was noted in May than April, the latter month proving one of the dullest so far this year.

The summer outlook is generally fair, especially in the rural communities, if cotton continues to maintain the present price level of 31 cents per pound, which it has now held for some time. Prospects are for a crop of about 11,500,000 bales, which at 31 cents will insure growers highly satisfactory returns.

Baltimore

BALTIMORE, MD., June 4—Almost unprecedented weather conditions this spring have had their effect upon the retail automobile business in Baltimore. Both rain and cold have combined to hold off the buying to a great extent.

Those who keep a close watch on the trade, however, declare that some of the dealers have made money. Others, they say, are breaking about even, and some have lost on the season. Sales for the most part have been below the corresponding period of last year, with profits also showing a proportionate decline.

Dealers hold out hopes that with the arrival of better weather there will be a marked increase in their business, but they fear that even if this comes about it is very doubtful if the business already lost because of the late season will be recovered to a very marked degree. Some of them also fear that 1924 will not measure up to the mark because it is a Presidential year, and there always are some persons who let this fact interfere with buying.

Dealer stocks are in good condition on both new and used cars. For some time the used car situation in Baltimore has been showing marked improvement.

(*Conditions in other cities on pages* 1256 *and* 1257)

BETTER OUTLOOK PRESENTED FOR JUNE

Surplus Car Stocks Will Show Depletion

But Production for Month Is Not Likely to Reach Figure of Either April or May

DETROIT, June 4—The general production and industrial situation in the Detroit district shows a rather more hopeful outlook for June than for the last several months. By this it is not meant that production will show higher figures than for April and May but that the surplus stocks accumulated in the winter and early spring months will be cleared away to a large extent and that July may see a resumption of production on a much larger scale.

May production for the entire industry, according to preliminary estimates will run about 300,000, a 19 per cent drop from the April totals. Of this about 160,000 were Ford cars and trucks and about 24,000 trucks of all other makes, leaving a passenger car balance for the rest of the industry of about 116,000.

This latter figure spread out over all manufacturers indicates that production is being held to low figures while the car surplus in dealers' hands is being cleared away. Retail deliveries for the country will show a much higher figure than the May production total. In the case of the Ford company alone, May deliveries approximated about 220,000 or a total of 60,000 cars and trucks that were drawn from dealer stocks.

Ford Output Lighter

Estimates by the Ford company of June business call for at least 200,000 retail deliveries with production somewhat less than during May. This, according to the company, will result in clearing off all new car stocks in dealers hands by July and permit of larger production from that time on. The company has declared very definitely that no men are or will be laid off and though some working hours have been shortened no employees are out of work or will be.

There are some employees of other companies out of work but in the majority of cases the worst that has happened to anyone is shorter working hours, with the factories generally working on a 40 to 60 per cent basis Buick's schedule for June production is 14,000 cars, which compares with a capacity of from 20,000 to 24,000. The Dodge Brothers schedule for June is approximately capacity of 20,000 to 24,000.

Hudson-Essex and Maxwell-Chrysler show operations that approximate capacity output, while many of the other companies are working at high figures turning out specialty cars introduced in the late spring and early winter. Reo is working at approximately 100 per cent capacity on its passenger car line, this being attributed to a large extent to the popularity of its balloon tire models.

Production is well sustained in the high priced lines. Both Packard and Cadillac are operating at close to normal figures while Lincoln and Wills Sainte Claire are building more cars than ever before.

Business in Brief

NEW YORK, June 2—There is no disputing the fact that both trade and industry are feeling the result of the long spell of adverse weather conditions, resulting in a decided lull in nearly all lines. Not only crops but retail trade has been affected by the many rainy days. In addition to this non-employment has undoubtedly retarded the business of the retailers, who are buying cautiously because of conditions.

The Middle West has been complaining that excessive rains have affected the crops, and in Kansas and Nebraska it is claimed there has been deterioration. In the Northwest spring wheat is in fair shape, while corn planting has been delayed by cold weather in some areas and too much rain in others.

The textile market is marked by small and cautious buying, with the demand limited. Signs point to the mills trying to reduce production costs, with the attendant threats of strikes and wage reductions. Production has been cut, and there is considerable unemployment.

Car loadings for the week ending May 17 were slightly in excess of the preceding week, with 913,407, as compared with 909,187, but considerably behind the same week a year ago, when the total was 992,-319. For the 20 weeks of this year the total was 17,823,118, against 18,009,683. Railroad earnings for April show a decrease in net of 23 per cent in comparison with the same month in 1923.

Holidays and the general dullness also affected the stock market, which was inactive and the volume of trading exceedingly small. Rails after a short spurt lagged, showing only fractional losses for the week at average prices. Bonds were active but irregular and money easy.

Body Builders Stage Convention and Show

Developments in Industry and Business Situation Discussed at Detroit Meeting

DETROIT, June 4—The annual convention of the Automobile Body Builders Association was held at the Hotel Statler here yesterday and today. In addition to the usual meeting the convention was featured by the exhibits of about 35 manufacturers of body hardware, trimming, and finishing materials.

The outstanding feature of the meetings was the general opinion that body finishing materials, including paint and varnish, have lagged behind the developments of automobile mechanical engineering. Car and body makers as well as the old line paint and varnish manufacturers have awakened to the importance of this fact and the latter are devoting their best efforts toward the remedying of the situation. Four new systems of body finishing were described during the session devoted to automobile body finish.

From the business angle as referring to the general situation, H. H. Rice, president of the Cadillac Motor Car Co., stated that it was his sincere opinion that the worst of the present temporary recession is past. He stated that no one has ever made any money by attempting to sell either the United States or the automobile industry short. The adverse prophets in each case have always missed the mark. His own company has sold more cars in the last two weeks than in the corresponding period last year.

Speaks of Service Complaints

Referring to the automobile body, Mr. Rice stated that five times as many service complaints originate from the body and its finish as come from the power plant and chassis, for the reason that the service is about 10 times as severe as horsedrawn usage which up until recently was the criterion of all coach work.

In the absence of Robert H. Clancy, the champion of automobile tax reduction in the House of Representatives, his speech was read by F. D. Mitchell, secretary of the association. This address reviewed the recent fight for tax reduction in the House and drew the conclusion that inasmuch as the automotive industry has been forced into politics against its will, there is no reason why every legitimate advantage should not be taken of this position.

Mr. Clancy paid tribute to the co-

(*Continued on page* 1254)

Ford Wins Electric Welding Patent Suit

United States Supreme Court Hands Down Opinion Against Thomson Company

WASHINGTON, June 4—The Ford Motor Co. of Detroit, after 12 years of litigation, has won in the United States Supreme Court a patent infringement suit brought against it by the Thomson Spot Welder Co. of Massachusetts.

The Thomson company alleged in its suit that it was the patentee of an improved method of electric welding which was used by the Ford company and claimed a royalty, which, if it had won the suit, would have cost the Ford company millions of dollars.

Suit against the Ford company was filed on Dec. 3, 1912, covering alleged infringement of U. S. Patent No. 1,046,066, covering the improvement claimed in electric welding. The District Court of Michigan dismissed the suit on "lack of invention, prior public use and estoppel." The case was taken to the Circuit Court of Appeals, which held the patent invalid for lack of invention, and the decisions of the two lower courts were affirmed by the Supreme Court.

The courts held that Johann Harmatta who secured the letter patent on Dec. 3, 1903 involved merely the exercise of mechanical skill and not invention. Decision of the Supreme Court declared that the art of electric welding, invented in 1886, was well advanced when Harmatta filed his application and the facts showed that from two to five years before the issuance of the Harmatta patent, which had been purchased by the Thomson Spot Welder Co., numerous manufacturers put out for use similar spot welding machines.

Thomson Company Statement

BOSTON, June 4—Commenting on the decision of the Supreme Court in the case of the Thomson Spot Welder Co. vs. the Ford Motor Co., which favored the Detroit concern, George A. Cutter, president of the Thomson company, today made the following statement:

The suit of the Thomson Spot Welder Co. vs. the Ford Motor Co. was brought to determine the validity or invalidity of the Harmatta patent, the claims of which cover the process of electric spot welding. The case was brought in the District Court of the United States for the Eastern District of Michigan and was appealed to the Circuit Court of Appeals for the Sixth Circuit which court rendered a decision adverse to the patent. There having been a decision in favor of the patent by the Circuit Court of Appeals for the First Circuit, the Ford case was taken to the Supreme Court of the United States on a writ of certiorari.

The Supreme Court has just rendered a decision which is in substance to the effect that the Harmatta patent is invalid. The matter having been conclusively settled we shall hereafter be prepared to furnish electric welding machines on a competitive basis with our experience and service back of each machine.

SEES END IN SIGHT OF SURPLUS STOCKS

NEW YORK, June 3—A. P. Sloan, Jr., president of the General Motors Corp., who is making a business tour of the country accompanied by four other General Motors executives, is quoted from Minneapolis by a Dow, Jones & Co. representative as predicting that by July or August the stocks of automobiles on hand will be pretty well exhausted. He says there will be no bargain sales of cars, and that he believes automobile prices are at the low level.

"Production is gaged to meet the requirements of the trade," he said. "One of the big troubles in the automobile business is that dealers and manufacturers all have the habit of expecting business every year to be far in excess of that of the preceding year."

10 Millionth Ford Car Will Cross Continent

DETROIT, June 4—Productions of the ten millionth Ford car will be signalled through the country by a demonstration of the car on a transcontinental trip over the Lincoln Highway from New York to San Francisco. The last million cars have been built by the company in 132 working days. Under capacity operating conditions this number of days would have been close to 100.

The car is specially painted and marked for its coast to coast demonstration and will be piloted by Frank Kulick who is familiar to many in the industry as a driver of the original Ford racing cars. It will be shipped to New York and then started on its long trip, Ford dealers along the route being advised of its schedule.

Receiver Is Appointed for Philadelphia Coach

PHILADELPHIA, June 3—John B. Keenan has been appointed receiver of the Philadelphia Motor Coach Co., with power to continue the business. The action was brought about through the filing of a petition signed by the General Reproduction Co. and other creditors, whose claims amounted to $3,457.

The company, organized in 1923 as Mitten-Traylor, Inc., changing to its present title later, is a manufacturer of motor buses and had completed ten buses for the Philadelphia Rapid Transit Co. Its liabilities, consisting of notes and accounts payable, amount to $67,640, while the inventory totals $109,742.

Tax Reduction Bill Signed by President

Becomes a Law Effective July 1—Walsh Amendment Not Included in Measure

WASHINGTON, June 2—The 1924 tax bill became law today when President Coolidge affixed his signature to it. It becomes operative on July 1, which will mean to the automotive industry that on and after that date purchasers of automobile trucks costing less than $1,000 will be tax-free and that bodies for trucks costing less than $200 can be purchased without the payment of the 3 per cent excise tax. Trucks over $1,000 are taxed 3 per cent.

The measure, which carries altogether a reduction of $25,000,000 for excise taxes collectible from the automobile industry, cuts in half the 5 per cent tax on tires, tubes, automobile accessories and parts, and beginning July 1 the purchasers of these items will be taxed only 2½ per cent. Automobiles, as heretofore, will be taxed 5 per cent.

Had the Senate and House conferees permitted the Walsh amendment to the revenue act to stand, which eliminated the entire "nuisance" tax, it would have resulted in the saving of an estimated sum of from $3,000,000 to $5,000,000 in the accounting cost of manufacturers and dealers, who must make monthly reports to the Government of all accessories, tires, tubes and parts sold.

This was one of the contentions made by Senator Walsh, who told the Senate that the collection of the tax would cost the automotive industry almost as much as the 2½ per cent levy would yield.

Second World Transport Congress Will Be Held

NEW YORK, June 4—Directors of the National Automobile Chamber of Commerce have authorized the holding of a second World Motor Transport Congress and Secretary George F. Bauer of the Chamber's Foreign Trade Committee has been empowered to name the date and select the location.

The success of the Congress last month was so great that the N. A. C. C. directors did not hesitate to give their approval to a continuance of relations with foreign customers. They feel, however, that the next convention should differ somewhat from the first in that the foreign delegates having been taught the major principles of the American industry they should be taken a step further next time.

With this idea in mind, it is likely that the next Congress will be held either immediately before or after the New York show. This of course would mean the holding of the convention in New York City and would bring the date either in December, 1925, or about the middle of January, 1926.

Continental Earned Profit of $1,343,744

Net for Six Months Ended April 30 Compares with $398,267 in Previous Year

DETROIT, June 2—Net profits before Federal income taxes of $1,343,744 are reported by Continental Motors Corp. for the first six months of its fiscal year ending April 30. This compares with net profits of $398,267 for the same period in the previous year. Deducting allowance for income tax of $180,000 and further deductions of $382,169 for dividends and premiums on the 7 per cent gold notes redeemed, the surplus account shows a balance as of April 30 of $8,335,551.

Current Assets $12,939,334

Net property investment of the company at the end of the six months period was $21,710,162, as compared with $22,380,798 as of Oct. 31, 1923. Current assets are $12,939,334 as against $11,813,558. Inventories have been reduced from $8,471,729 to $8,200,222.

Receivables from customers' accounts have increased to $1,998,095, from $1,177,913. Cash has mounted to $2,047,586 from $1,541,299, and total assets have increased from $34,748,608 to $35,892,334.

In a statement to stockholders accompanying the report, President Ross W. Judson says:

Many important developments of vital interest to the stockholders have taken place during the first six months of the current fiscal year. The comparative balance sheet and the income account submitted herewith disclose:

(1) All bank indebtedness and notes payable paid in full.
(2) The 7 per cent serial gold notes ($750,000 maturing April 1, 1924, and $3,000,000 maturing April 1, 1925) redeemed and paid in full.
(3) A fifteen year 6½ per cent bond issue for $7,500,000 negotiated, concluded and proceeds applied.
(4) The ratio of current assets to current liabilities increased to 5 to 1 from 2 to 1.
(5) A substantial increase in profits.
(6) The resumption of quarterly dividends on the common stock.

Based upon firm contracts in hand and schedules recently given us by our customers, our sales for the last half of the fiscal year should be substantially in excess of the sales for the first half.

Reports Growing Demand

There is now present a heavy and growing demand for our new line of bus motors. Our manufacturing economies, made possible by the latest improved machinery and plant efficiencies, are attracting inquiries for large production from new customers.

Many of our present customers have strengthened their positions and have enlarged their schedules. Therefore we confidently anticipate a correspondingly satisfactory showing during the balance of the fiscal year.

COMMERCIAL AIRPLANE FLIES TO PORTO RICO

NEW YORK, June 2—The first flight of a commercial airplane between the United States and Porto Rico has been completed by C. J. Zimmermann in the Morro Castle II, the first metal hull flying boat to be constructed in this country. Zimmermann left here Jan. 16 and returned May 27, traveling 14,000 miles in his flight. From Porto Rico here required 35 hours 30 minutes of flying, during which 2700 miles were traveled.

The hull of the boat is built entirely of 17S alloy, a metal as light as aluminum and claimed to be as strong as steel. It has seven watertight bulkheads and is designed to be free from water soakage.

Zimmermann declares that San Juan will be the fueling point between New York and South America in future air travel, the harbor there affording excellent facilities for seaplane work.

L. H. Gilmer Markets $600,000 Bond Issue

PHILADELPHIA, June 2—The L. H. Gilmer Co., manufacturer of fan belts, rebound straps, tire straps, treated fabric for anti-squeak purposes, radiator and hood lacings and transmission linings, has placed on the market $600,000 worth of first (closed) mortgage 10-year 7 per cent sinking fund gold bonds. The new financing is undertaken to reduce current liabilities and provide additional working capital.

In a statement the company says that the average annual net earnings for the last six years are $133,989, or 3.19 times the maximum annual interest charges upon the bond issue. In 1923 the company's net sales before depreciation and interest charges totaled $2,526,638, with net earnings of $158,145. The appraised value of the company's plants at Philadelphia and North Wales, Pa., is $1,250,697, the bond issue being secured by a first mortgage upon the property.

Keystone Truck Business Acquired by Penn Motors

PHILADELPHIA, June 2—The Penn Motors Corp. of this city has purchased the entire business of the Keystone Motor Truck Corp. of Oaks, Pa., and will carry on all parts business formerly done by the Keystone company, which includes Keystone trucks and Hudford and Truxtun units. In addition, the Penn company will continue with its Penn heavy-duty trucks, Pennford trucks and a 1-ton commercial car using the standard Overland engine.

Hilton W. Sofield, vice-president and general manager of the Keystone company, three years ago, is president of Penn Motors.

W. A. Cluff Is Named Head of Mason Tire

Former Secretary Also Chosen Treasurer, Succeeding the Two Mason Brothers

CLEVELAND, June 4—O. M. Mason has resigned as president and director and his brother, D. M. Mason, has resigned as treasurer and director of the Mason Tire & Rubber Co., in order to give more attention to the growing demands of other activities.

W. A. Cluff, former secretary of the company and in that capacity in charge of the company's financial operations, has been elected president and treasurer. He joined the company in 1917 as a special accountant, was made assistant treasurer and subsequently elected secretary.

Graham Succeeds Cluff

Col. H. P. Shupe of Cleveland and T. G. Graham have been elected directors to fill the unexpired term of the Mason brothers. Mr. Graham, who succeeds Mr. Cluff as secretary, has been factory manager for the last three years and has been identified with the tire industry for the last ten.

J. H. Diehl continues as vice-president and sales manager. He has been identified with the tire industry for 25 years.

Mr. Cluff states that economy plans contemplate a reduction in manufacturing costs and in overhead generally, with the expectations of converting a deficit of $535,000 last year into a profit this year. Ten of the 29 branches of the company will be turned into distributing points.

The company was promoted and organized by the Mason brothers, who have served as its executives since 1915. It turned out its first tires in 1916. The initial capital stock of the company was $250,000. Today it has 100,000 shares of Series A, no par stock; 133,584 Series B common stock; $5,991,880 of 7 per cent preferred stock and $2,000,000 of first mortgage 7 per cent bonds. It has assets of $10,000,000 and has 10,000 stockholders.

About 10,000 men are employed by the company in its Kent and Bedford plants and in its 29 branches throughout the country. At present it is producing about 2300 tires daily at its Kent plant and 1300 at Bedford. The daily capacity of the plants is about 6000 tires.

Sales in April High

April sales totaled $958,000. Net profits after all necessary charges amounted to $43,000, or considerably more than is needed to take care of dividend requirements. May sales will show further improvement.

Gross sales have increased from $300,000 in November to more than $3,500,000 for the first four months of this year, an average of about $900,000 in sales a month.

1925 Chandler Model Has 4-Wheel Brakes

Equipment Made in Company's Plant Is Optional—Prices of New Cars Higher

CLEVELAND, June 3—The 1925 Chandler models will be announced to the public June 8. The outstanding new feature is the four-wheel brake equipment, which is supplied as an extra but which is built in the Chandler factory and is of the mechanical type. The "Pike's Peak" engine and traffic transmission are retained.

Prices of the new models are about $100 higher than for corresponding 1924 cars, the new list being:

Phaeton	$1,585
Chummy sedan	1,845
Four-door sedan	1,995
Seven-passenger sedan	2,195

An extra charge of $60 is made for the four-wheel brake equipment. In addition to this feature, there are a number of refinements of various kinds throughout the chassis. Balloon tires are standard equipment on all models. The Zerk pressure system of lubrication has been added. The headlamps are of new type with an improved combination of lens and reflector. The gas and spark levers are of the new compact type.

Seat Cushions Larger

The seat cushions in the phaeton are larger than in previous models. A new carbureter is claimed to give better operating characteristics, while a larger vacuum tank insures an ample fuel supply at all times. The accessory drive sprocket has been increased in size to increase life and the battery connections are of the universal type permitting the use of any make of battery without a change of terminals. The cylinders now are finished by honing, the oil pressure has been increased and changes have been made in the oil pump and circulation system.

The four-wheel brakes are of the mechanical type and the braking system has only nine lubrication points. The front brakes are of the external type, practically a duplication of the rear-wheel equipment, in which there has been no change. The new brakes are adaptable to all kinds of wheels and tires, but they cannot be applied to previous car models.

Brake Construction

The entire brake assembly is built upon the front axle I-beam. There are no operating shafts bracketed to the frame. The location of the king pin with relation to the wheel is such as to give the greatest ease in steering with a minimum of wear on the tires. The universal ball joint on the front brake operating shaft insures free brake action at any steering angle. The ball joint, which is located exactly in the center line of the king pin, operates in a bath of oil and the operating shaft joints are both dust and water proof.

The brake leverage is such that additional braking effort is obtained without increased foot travel or pedal pressure. The braking system is completely equalized.

EQUIPMENT BUSINESS COSTS ARE SURVEYED

CAMBRIDGE, MASS., June 5—The Harvard Bureau of Business Research has closed the study of the wholesale automotive equipment business, undertaken at the request and under the auspices of the Automotive Equipment Association and within a few weeks will issue a bulletin summarizing costs, profits and other features of businesses of something like 150 jobbers.

The bureau at the same time is making a survey of the retail tire field and up to date has received 186 statements. This investigation will be held open until about the middle of July.

Single Seater Taxicab Satisfactory in Paris

PARIS, May 24 (*by mail*)—Single seated taxicabs, introduced on the streets of Paris about three months ago, have proved satisfactory, and according to the company operating them, have net earnings equal to those of the big size taxicabs, although the charges are nearly 50 per cent less. This result is attributed to the fact that the cabs practically never stand idle.

During the first few weeks results were poor, due to the novelty of these little cabs and the crowd of idlers who stood around examining them. It was observed that would-be clients took any cab rather than push through a crowd to reach the single seaters. Immediately the novelty wore off the cabs became profitable. At the present time there are 60 in service, and the number is about to be increased. The single passenger cabs operate only between 7 a. m. and 8 p. m., the limit hour for returning to the depot being 9 p. m. There is no Sunday work and only light hand baggage is carried.

Racine Horseshoe Tire Reelects All Officers

MILWAUKEE, June 2—At the annual meeting of stockholders of the Racine Horseshoe Tire Co., Racine, Wis., all directors were re-elected except Harold Green of Boston, who is succeeded by William T. White. The present officers later were again chosen by the directors.

The president's report stated that the plant continues to operate 24 hours a day and that profits were being maintained at a satisfactory level.

New Gray Financing Under Consideration

One Plan to Be Taken Up by Directors Takes the Form of a Stock Issue

DETROIT, June 3—Directors of the Gray Motor Corp. will meet this week to act upon plans for refinancing the company which, it is understood, will take the form of a new issue of stock, although there are several plans under consideration and none has been definitely determined upon. Under the proposed financing the needs of the company will be amply taken care of and the company will be enabled to continue under its enlarged production program.

In anticipation of the new financing the company has arranged with parts makers for extended credit which has been readily granted, as the company and its product are considered to be making good headway under present conditions. The extension of credits has no significance other than its part in getting the new financing plans under way.

The name of Gray Motors has been connected up with a number of merger reports since the first of the year, one at least of which was considerably advanced but was later dropped because of inability of the parties concerned to agree on terms. Under this merger the interests of the present owners would have been taken over by a new organization and the company joined with another manufacturing a car in the $1,000 price class.

Company Forging Ahead

Since the abandonment of this merger the company has been making steady progress under its original owners. Plans have been under way for several months to add capital necessary for placing the company in a strong position. The dealer organization has been considerably strengthened and the company is now engaged in vigorous merchandising plans.

New 1½-Ton Truck Model Announced by Republic

ALMA, MICH., June 3—The Republic Motor Truck Co. has put into production a new 1½-ton model to be known as Model 10-F. It is an all-purpose type and an outgrowth of the Model 10. A new type pressed steel radiator is one of the noticeable features and drum headlamps are part of the regular equipment.

The wheelbase has been considerably lengthened and the frame rails are deeper and thicker. Bosch starting and lighting and a vacuum tank are standard equipment. The Republic driveshaft brake, consisting of two lined contracting shoes, is now used on this lighter model and either pneumatic or solid tires can be had.

38 Latin Americans Start Highway Tour

President Coolidge and Secretary Hughes Greet Road Commission in Washington

WASHINGTON, June 4—The Pan-American Highway Commission consisting of 38 engineers, economists and financiers from 20 Latin American republics began its four weeks road inspection tour of the United States and visit to automotive centers this week with a two-day stay in Washington, replete with entertainment and sight seeing trips about the Capitol.

On Monday the delegates were received at the White House by the President and at the Department of State by Secretary Hughes. As the guest of the Highway Education Board the 48 hour stop here was spent in meeting automobile manufacturers and highway engineers and visiting government bureaus engaged in highway construction and allied interests.

Departments Visited

These included the Bureau of Public Roads, the Department of Agriculture's experimental road building plant at Arlington, the Bureau of Standards, and the offices of the National Automobile Chamber of Commerce and the American Automobile Association.

Socially the two days were interspersed with receptions at the embassies, with a buffet luncheon at the Pan-American Building, when the delegates were addressed by Secretaries Hoover, Wallace and Davis and Assistant Secretary J. Walter Drake. Mr. Drake outlined the purpose of the visit of the commission and declared it would lead to "common benefit both to the United States and to the Latin American countries."

President Extends Welcome

Dr. L. S. Rowe, director general of the Pan-American Union, introduced the delegates to President Coolidge who extended them a cordial welcome.

"The tour of inspection that you are about to undertake and the studies in which you are about to engage are matters of very real significance to all the republics of the American continent," the President said.

"We see today, more clearly than ever before, that the improved means of communication is not only one of the great forces making for cultural and economic advance, but it is also one of the basic factors in the development of Pan-American unity."

Following the visit to the White House, the delegation proceeded to the home of the Pan-American Union, where a tree commemorative of the occasion was planted. Secretary Hoover voiced the appreciation of the engineering fraternity at the presence in this country of the Latin Americans.

In his remarks, Mr. Chapin told the delegates that the war had developed the fact that the United States was without adequate means of transportation, that the railroad facilities were insufficient and that highways for motor transporation must fill the breach, especially for short hauls. As a result of the demand for highway transport in this country, he pointed to the fact that today the United States has more automobiles than telephones and is rapidly developing a national highway system to take care of motor transportation.

He said further:

The picture that we want you to take back with you is how we have built up a great highway system, how we build our automobiles and how we tie the roads up to the automobiles and have today what is unquestionably the world's finest and most complete highway transportation system in the world.

In Detroit we'll show you how we make our automotive equipment; in Akron, how we make our tires, and on this inspection tour you will be given a concerete picture of how we build roads under conditions similar to those in your country.

Entertained the Visitors

Executives who spent the two days with the delegates in Washington include among others:

Mr. Chapin; W. O. Rutherford, president, and A. L. Viles, general manager of the Rubber Association of America; A. J. Brosseau, Mack Trucks, Inc.; Windsor T. White, Jay Rathbun and R. L. Boughton, White Motor Co.; H. S. Welch, Studebaker Corp.; R. E. Olds, Reo Motor Car Co.; M. H. Hoepli, General Motors Export Co.; John J. Palmer and C. H. Jennings, Dodge Brothers; and Herman Deuster, Motor and Accessory Manufacturers Association.

George F. Bauer and Pyke Johnson, N. A. C. C.; Percy Owen, chief of the Automotive Division of the Department of Commerce; Pablo Homs, Cole Motor Car Co.; Donald Cameron, dealer in New Zealand; Dr. Guillermo Sherwell, Inter-American High Commission; Thomas H. MacDonald, chief, Bureau of Public Roads; C. M. Babcock,

(*Continued on page* 1255)

RAILROADS PROSECUTE NEGLIGENT MOTORISTS

NEW YORK, June 2—In their efforts to reduce the number of automobile accidents at grade crossings, Eastern railroads have adopted new and radical tactics. This is taking the form of prosecution of motorists who crash through closed gates, thus injuring railroad property. One railroad, the identity of which is not disclosed, is reported to have prosecuted successfully seven of such cases within the last month.

Another railroad, the Pennsylvania, not only is prosecuting but is also writing letters to violators, calling their attention to property damages such actions cause and asking them to be more careful in the future.

Wolseley Cuts Lists to Quicken Business

Disorganized State of Sales Due to Duty Removal—Cut Is 23 Per Cent on Open Models

LONDON, May 26 (*by mail*)—A bombshell has been dropped by Wolseley Motors, Ltd. (a subsidiary of Vickers and one of the most important passenger car makers in England), by an announcement of big reduction in the prices of the 15 hp. (3⅛ x 5½ in. overhead camshaft "Four") models. The five-passenger open car, previously £745, is reduced to £575, a drop of nearly 23 per cent; the sedan falls from £895 to £750 (16 per cent), and the limousine-landaulet from £1,050 to £875 (16 per cent).

The open car price includes an extending rear windshield, framed side paneling for the folding top, spring gaiters, clock, speedometer, two horns and other normal items of equipment, as well as the superfine finish previously attached to this model.

These reductions have followed, with a couple of months' interval, others applying to the 14-hp. Wolseley models, but are far more extensive. They are reported to be due to a reorganization of manufacturing methods, for which scope has been provided by the greatly increased output which has occurred of late years.

It is believed, however, that the Government's announcement that the import duty on cars will be allowed to lapse on July 31 and the consequent disorganization of sales during the past three weeks have had their effect in putting forward the date upon which the company originally intended to make these latest reductions.

Sales at Johannesburg Show Below Last Year

JOHANNESBURG, SOUTH AFRICA, May 5 (*by mail*)—Dealers say the number of cars sold at the annual automobile show, held here last month, was not quite as great as last year but that business was very good considering the unsettled political situation. A general election is due in June when it is believed the Nationalists, a somewhat radical group, will come into power. This probability is having a deterrent effect on business at the present time.

American made vehicles exhibited at the show, which is considered a national one, included Buick, Cadillac, Dodge Brothers, Durant, Essex, Ford, Hudson, Hupmobile, Lincoln, Maxwell, Nash, Oakland, Oldsmobile, Overland, Packard, Reo, Studebaker and Willys-Knight.

A large number of closed cars were shown. This type is gaining in popularity rapidly in South Africa.

Men of the Industry and What They Are Doing

Alvan Macauley Returns Home

Alvan Macauley, president of the Packard Motor Car Co., returned from his European trip in time to attend the annual meeting of the National Automobile Chamber of Commerce. Mr. Macauley reports that his trip changed his views as to the foreign outlook, which he says is much better than he looked for. He found that the Packard eight is more popular than the Packard six in England and France, it being impossible to supply the demand for this model in England and France.

Olds Back from World-Wide Trip

R. E. Olds, chairman of the board of the Reo Motor Car Co., has returned from a 34,000-mile trip around the world, reporting that business in the Orient is bad, and that modern automobiles are not found outside of Hongkong and Shanghai, where the foreign population is a big factor. Japan, he says, is rapidly recovering from the effects of the earthquake.

Earl with Appliance Company

Clarence A. Earl, former head of Earl Motors and later president of National Motors, has left the automobile industry to accept the presidency of the Serrell Electric Appliance Co. of New York. This company will manufacture and assemble a new type of electric cooking range and allied products. It is planned to locate the plant in New Jersey.

Sherer Assists G. M. Williams

Carl J. Sherer, formerly secretary and treasurer of the Dayton-Wright Co., has been chosen special assistant to G. M. Williams, the new president of the Nordyke & Marmon Co., in the management and financial control of the company. Mr. Sherer was treasurer of the Speedwell Motor Car Co. from 1909 to 1914 and at the time the United States entered the war he was treasurer of the Dayton Metal Products Co., making war munitions. Later during the war he held the position of treasurer of the Dayton-Wright Co., handling these two positions simultaneously.

A. A. Bull Sails for Europe

A. A. Bull, chief engineer of the Northway Motor & Manufacturing Co., a General Motors division, has sailed for Europe. Mr. Bull will be gone about two months.

Harding Columbia Service Manager

Sam V. Harding, formerly of the Nordyke & Marmon Co., has been appointed service manager of the Columbia Motors Co. As service engineer of Marmon he devoted a great deal of his time to traveling, educating dealers in proper servicing, and supplemented this educational work by conducting a service school at the factory. In his new position he will conduct a comprehensive service educational campaign among Columbia dealers.

C. C. Miner Resigns

C. C. Miner has resigned as president and general manager of the Inland Products Co. of St. Louis, manufacturer of Inland piston rings and other automotive products. Mr. Miner has no plans for the immediate future but expects to continue in the industry with which he has been connected for many years.

Herrick in New Connection

Howard U. Herrick, for twelve years factory manager of the Brown-Lipe Gear Co., has resigned to become general manager and vice-president of the V. & O. Press Co. at Hudson, N. Y. He has been succeeded by Lee Howell, who was Mr. Herrick's assistant for seven years.

Burrell Is Haynes Comptroller

C. A. Burrell, former credit manager of the Motor and Accessory Manufacturers' Association, has been appointed comptroller of the Haynes Automobile Co. of Kokomo, Ind.

McIntyre with Philadelphia Spring

M. M. McIntyre, who founded the Perfection Spring Co. with Christian Girl in 1906, has severed his connection with that company to become general superintendent of the Philadelphia Spring Works in which he is financially interested. Mr. McIntyre was the last member of the early Perfection organization and had been superintendent since its formation.

Continental Appoints Kline

Harry Kline has been named advertising and publicity manager of the Continental Motors Corp. He formerly was advertising manager of the Corduroy Tire Co.

Argentinian to Circle Globe in Fokker Planes

NEW YORK, June 4—Advices received by the American representatives of Anthony H. G. Fokker state that Major Pedro Zanni, an Argentine aviator, is about to start on a flying trip around the world.

The flight will be made in three stages, the first being flown in a Fokker C IV machine with wheel undercarriage, the second in a similar plane equipped with pontoons and the third and last stage across the ocean in a seaplane.

New Titles Awarded to Fields and Zeder

For Their Efficient Administrations, Maxwell Makes Them Vice-Presidents

DETROIT, June 2—Joseph E. Fields has been named vice-president in charge of sales of the Maxwell-Chrysler companies and Fred M. Zeder, vice-president in charge of engineering, the new appointments being made by W. P. Chrysler, president and chairman of the board, effective June 1. Mr. Fields and Mr. Zeder had been in charge of these branches at the factory previously, and their promotions to the vice-presidencies is in recognition of their efficient administrations.

Mr. Fields became identified with the Maxwell interests about a year and a half ago. His first work was as director of sales of the Chalmers subsidiary, serving in this capacity under the late Arthur E. Barker who was vice-president in charge of sales until his death just previous to the last New York show. On the death of Mr. Barker, Mr. Fields was named general sales manager, in charge of all Maxwell, Chrysler and Chalmers sales work.

Previous to joining the Maxwell organization, Mr. Fields had a long and varied experience in the industry, beginning with the former Thomas Detroit company. He was later with Hupp and the Liberty companies, resigning from the latter to join Maxwell. He has served as a dealer, territorial manager and factory sales manager and is one of the best known men in the distribution field.

Mr. Zeder and his two chief associates, Carl Breer and O. R. Skelton, allied themselves with Mr. Chrysler four years ago, later giving up general consulting work to devote their entire time to Mr. Chrysler's plans which included the development of the present Chrysler line. With his associates Mr. Zeder became actively connected with the Maxwell organization just previous to the presentation of the Chrysler and has been in charge of engineering since that time.

Marre Named Chicago Representative

L. A. Marre, formerly with the Pullman Co. and the H. Shannon Co. of Chicago, has been appointed Chicago representative of the Balcrank bumper by the Cincinnati Ball Crank Co., covering Chicago, Milwaukee and surrounding territory inclusive of Gary and Hammond, Ind., and northern Illinois.

Tire Output Reduced Earlier Than Usual

Estimates Place Present Production of Casings at Approximately 85,000 Daily

AKRON, June 4—Automobile tire production has been reduced to approximately 85,000 casings a day, according to estimates made here.

This new production figure conforms with estimates prepared a month ago as to production at the beginning of the sixth month of the year, but the curtailment process which has been under way for several weeks is on the whole approximately one and one-half months early, as compared with the usual seasonal curtailment period.

Reductions have been brought about by elimination for the most part of third shifts and reduction of working days for different departments. Decline in demand for tires from automobile makers has been more responsible for reduced operations than a curtailment of retail buying, although the latter has not been without its effect upon the industry.

Further Reductions Likely

It is generally believed that operations will be further reduced before the new low for the year is reached from which production will go upward at the beginning of the fourth quarter. It is not believed that the industry as a whole will see any advance in production during the third quarter of the year. Delay in the opening of the motoring season combined with large stocks in the hands of retailers are responsible for the prediction that the third quarter will generally be sluggish.

Earnings, nevertheless, are satisfactory and it is believed will continue to be satisfactory during the third quarter, despite reduced operations. Prices, according to all present indications, will be maintained at present levels. Production costs will not be increased, and in some instances will show declines, while raw material prices will probably show no general upward movement in the face of the curtailment. Profits thus far this year have been very satisfactory, and only a price cut can mar the earning prospects of the second half of the year.

New Mohawk Tire

From Mohawk Rubber Co. come reports of the production of a new low-priced cord tire, which will soon be placed upon the market. The company's business has been satisfactory thus far this year. Production of balloon tires shows some increase.

Seiberling Rubber Co. reports that every month thus far this year has shown satisfactory earnings, while its plant is being operated at capacity at Barberton. This is the third year of the company's existence, and officials generally are op-

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ENTIRE RAIL SYSTEM WILL BE MOTORIZED

BALTIMORE, June 2 — The Maryland & Delaware Coast Railroad, recently incorporated, is equipping its entire system with gasoline motor coaches and freight trucks. The first of these put into operation is a 54 passenger FWD all-steel two-car train manufactured by the Four Wheel Drive Auto Co. of Clintonville, Wis.

Permanent A. A. A. Home Planned for Washington

WASHINGTON, June 4—A permanent home for the consolidated American Automobile Association and the National Motorist Association is to be located here for the housing of the activities of the merged organizations and taking care of its future expansion.

For the purpose of looking over sites and making plans to buy or erect a home, the following committee will meet in this city next week: Charles Hayes, president of the Chicago Motor Club; Col. Sidney Walton of Detroit, William Metzger of the Detroit Automobile Club. President Thomas P. Henry of the American Automobile Association, and Ernest Smith, general manager of the A. A. A. The committee will decide whether or not the Association will buy or build.

To date approximately 125 clubs, having a membership of 150,000 members, have ratified the consolidation agreement and applications for membership have been received from more than two score clubs which heretofore have not ben affiliated with either the A. A. A. or the N. M. A.

Shippers May Organize Coast Regional Board

WASHINGTON, June 4—Automobile and other shippers located in the Pacific Coast States were invited this week by the Car Service Division of the American Railway Association to meet in San Francisco July 11 for the formation of a shippers' regional advisory board.

Similar organizations have been created in other sections of the country, association officials announced, for the purpose of "bringing about a better understanding between the shippers and the railroads of their mutual transportation problems."

WISCONSIN TRUCK BANKRUPT

MADISON, WIS., June 2—The Wisconsin Truck Co., established about three years ago to build motor buses and motor trucks, has filed a voluntary petition in bankruptcy. Schedules reveal liabilities of $26,926 and claim assets of $13,000. The first meeting of creditors will be held at Madison on Thursday, June 5.

Used Car Allowance Estimated by Dodge

Says, in Educational Campaign, That Dealers Should Not Exceed 15 Per Cent

DETROIT, June 3—Fifteen per cent is set by Dodge Brothers as a necessary allowance for dealers to figure in the handling of used cars, this to be deducted together with the cost of reconditioning from the sales value of the car offered in trade, the balance representing the actual value or allowance in making a deal.

This method of appraisal is urged by the company in a special used car educational campaign now under way, which while directed specifically to dealers, also provides for bringing home the point of view to prospective buyers. The whole campaign has been reduced to six pieces of literature, two of which are for display in the salesrooms of dealers, the others to be studied by dealers and salesmen.

Issued in Pocket Size

Two of the pieces entitled "Used Car Common Sense" are in both pocket and poster size and are intended alike for the guidance of the seller and the buyer. One of the other pieces, "Information on Used Car Values," is recommended also for study by both seller and buyer, and dealers are advised to have patrons read it.

On the "Used Car Common Sense" poster the company says:

No used car buyer will be asked to pay more for any used car than it is worth. No new car buyer will be offered less on appraisal for his used car than it is worth. The actual market value of a used car depends entirely on its make, appearance, mechanical condition and the demand based upon the reputation of that make of car. All used cars will be purchased by us for cash or taken in as part payment on new cars only as outlined in the following examples.

Cites an Example

A. We will assume that the sales value of a certain used car in marketable condition is $600.

B. From this figure we shall deduct 15 per cent as follows: 5 per cent for commission, 5 per cent for overhead including rent, light, insurance, etc., and 5 per cent for advertising guarantee on used car to buyer and interest on money invested, $90.

C. Experience has shown that it cost about $84 to recondition thoroughly a car of this model in this condition. This amount is determined for the car by a careful appraisal made by a technical expert who knows the cost of the work required. This may include overhauling the engine or other units, replacing worn bushings in the chassis, repainting the body, dressing the top, replacing tires or any other work necessary in order that we may indorse it as a reliable used car.

D. It is quite evident that the actual value of a used car or the allowance price

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15 Cars at Finish in Endurance Tour

Only One of Starters Drops Out from Contest That Went Into Three States

FUEL ECONOMY SCORES

No.	Car	Gal. Gas	Qts. Oil	Points
3	Studebaker	117½	10	128
5	Jewett	105	8	113
6	Paige	137	3¾	140
7	Oakland	92½	1¾	95
9	Willys-Knight	99⅞	16½	117
10	Overland	66	2¾	69
11	Nash	114½	0	115
12	Buick	147	2	149
15	Maxwell	96¾	½	98
16	Chrysler	115	0	115
17	Lincoln	172¼	¼	174
18	Ford	66	1½	68
20	Chevrolet	70	5¼	76
25	Franklin	87	7	94.
27	Studebaker	95	6	101

EL PASO, TEX., May 30—Interest of the whole Southwest was centered in the 2000-mile endurance tour sponsored by the El Paso *Herald* and sanctioned by the American Automobile Association which began on May 17 and ended on May 28. Sixteen cars started and only one of them dropped out. Only two cars emerged without a technical penalty, honors for the trip going to a Buick light six piloted by R. A. Durio of the Las Cruces Buick branch, and a Ford driven by R. T. Wilson of the Alamo Motor Co., Ford dealer in El Paso.

The tour log sent the caravan from El Paso to Marfa and Pecos in Texas; Carlsbad, Roswell, Carrizozo, Albuquerque and Magdalena in New Mexico, and Springerville, Globe, Tucson and Douglas in Arizona, thence back to Silver City and El Paso. Continental divide was crossed in two places near Quemado, Ariz., and Silver City, N. M., the altitude at both points approximating 8400 feet.

All Types of Road Covered

Every type of highway was covered, varying from cement and high class graveled highways of Arizona to mountain trails in the northern part of that State which were almost impassable and full of boulder strewn washes and rocky mountainous passes. In 12 hours the cars dropped from a road lined with perpetual snow at 9400 feet altitude to an arid desert plateau 1000 feet above sea level. On the last day's journey the cars traversed 200 miles of desert country with a tail wind which made the wind-up particularly trying.

Near Socorro, N. M., approaches to Rio Grande, bridges were washed out and cars ploughed through roads under 18 in. of water. In addition to its perfect endurance performance the Ford led all entries on economy, tieing the Overland touring on gasoline consumption but using one quart less oil. Both cars averaged approximately 29 miles to the gallon of gasoline.

Results in Class E are under protest due to a ruling of Referee H. C. Lester placing the Paige and Franklin in that class. Under the present ruling the Franklin tops the class having been penalized 19 points, two for an engine stall and 17 for repairing the gasoline line.

Franklin also made a remarkable economy run when it finished with lowest gasoline and oil consumption of all entries excepting Ford, Overland and Chevrolet. The run was a convincing demonstration of the principle of air cooling as the Franklin negotiated sand and rock strewn roads, tortuous grades and varying altitudes without the slightest engine trouble. the sole engine stall being attributable to an error by the pilot.

Chrysler touring. entered in Class D, was probably the sensation of the tour. It made a flawless performance over the entire distance but was penalized 40 points due to a misunderstanding of the rules which resulted in the car checking in late at a night control. By averaging 20 miles to the gallon of gasoline. it won in Class D economy. The entry returned to El Paso without adding water or oil to the amount taken on at the start. Ex-

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Congress Provides Funds for Building of Highways

WASHINGTON, May 31—The annual Agricultural bill. containing $75,000,000 for the building of good roads under the Federal-aid plan. passed the Senate this week and has been sent to the President for signature. The money for road purposes is for the fiscal year ending June 30. 1925.

The Dowell bill, which is the Bureau of Public Roads' program bill and which provides for the allotment of $75.000.000 for two years, has not yet been reported out of the House Committee on Roads. Hearings on the measure were concluded several weeks ago, but the measure was caught in the annual legislative jam.

The House Rules Committee has promised to report out a special rule permitting the consideration of the bill, considered of vital importance, before the concluding session of the present Congress.

The Dowell bill provides for the legislative program for the fiscal year 1926 and 1927 and is considered essential by public road officials as a basis for the contracting of future obligations in the government's road building program.

FIRE AT GILLETTE PLANT

EAU CLAIRE, WIS., June 2 — The main plant of the Gillette Rubber Co. at Eau Claire, Wis., was saved, but the bicycle department building was damaged $35.000 or more by fire of undetermined origin last week. The damaged building was separated from the main factory by a 50-ft. alley.

Ford's Weekly Plan Delivers 80,000 Cars

Enrollments Have Passed 250,000 Mark, but Even Better Results Are Expected

DETROIT, June 4—Approximately 80,000 deliveries have been made under the Ford weekly payment plan in the year that it has been in operation, a large percentage of the deliveries being made in the first four months of this year and representing a considerable portion of the increased business that the company has experienced in this period.

Enrollments under the plan have numbered somewhat beyond the 250,000 mark, and there are at the present time about 170,000 enrollments for cars on which payments are being completed. Though the total enrollments are relatively high and have resulted in much business that otherwise might not have been developed, the company feels that the business possibilities under the plan are so large that the present enrollments represent only a scratch on the surface.

In the rush of spring business in the early part of the year, the work of enrolling prospects under the plan has been somewhat passed over to get immediate business, but though relegated temporarily to the rear, it is so important a part of the work of each dealer that the company is planning a special drive to aid dealers in getting prospects started toward a future purchase.

Results Not Uniform

Dealers in many parts of the country have made large increases in their business through use of the plan, and others have achieved only partial results. In every case where the dealer has worked steadily on enrollments, the work has been highly satisfactory, the company notes, and it is the intention to get all dealers solidly behind it.

Lumber Demand Better, Southern Mills Report

ATLANTA, GA., June 4 — Lumber manufacturers in the Atlanta territory report a gradual improvement the last ten days in demand from the northern automobile and body trades for southern cut ash, maple, elm and sap gum. Most manufacturers now of the opinion that the turning point to the better has at last been reached. For the last two months this trade has been less active than at any time in two years.

Representatives of southern mills calling on the automobile trade in Detroit and other northern cities predict a still further improvement during June, and a normal demand again in another month or two. Prices remain substantially unchanged except for sap gum, which has declined since May 1 about $1.50 to $2 per thousand feet.

S. A. E. Plans Ready for Summer Meeting

Program Arranged for Gathering to Be Held at Spring Lake, June 24 to 27

NEW YORK, June 4—Arrangements have been completed for the summer meeting of the Society of Automotive Engineers to be held at Spring Lake, N. J., June 24-27. During the four-day period, six professional meetings will be held dealing with riding quality, contamination and dilution of crankcase-oil, air-cleaners, standards and some of the newer steps in transmission design.

The semi-annual business meeting of the Society will be held on the evening of June 24, when members-at-large of the national Nominating Committee will be selected and reports of the Society's activities will be presented. The Standards Committee will meet on the morning of June 26.

Athletic and social features will form a part of the four days' activities as at previous meeting.

The subjects and speakers for the professional meetings are as follows:

JUNE 24
Afternoon

Subject—"Riding Quality."

Speakers—J. A. C. Warner, assistant manager of the S. A. E. research department, an analysis of the riding quality problem.

Prof. E. H. Lockwood and A. L. Kimball of Yale University, results of tests of an instrument which records the riding quality of different cars.

F. H. Norton of the Massachusetts Institute of Technology, results of experiments with an instrument of a different type.

Samuel P. Hess, spring design as related to riding quality.

JUNE 25
Morning and Afternoon

Subject—"Crankcase-Oil Dilution and Contamination."

Speakers—A. Ludlow Clayden, chief engineer of gas engine research of the Sun Oil Co., water condensation in lubricating oil.

Neil MacCoull, lubrication engineer of the Texas Co., findings of his investigation of crankcase dilution causes and effects.

C. M. Larson of the Sinclair Refining Co.

G. A. Round of the Vacuum Oil Co.

Ralph L. Skinner, history of the oil-dilution rectifier recently adopted on Rickenbacker models.

S. P. Sparrow, results of dilution tests made at the Bureau of Standards as a part of the Cooperative Fuel Research project fostered by the S. A. E.

JUNE 26
Evening

Subject—"New Transmission Systems."

Speakers—Prof. J. M. Nickelsen of the University of Michigan, European and American developments and analysis of the possibilities of doing away with transmission gears entirely.

W. A. McCarroll, description of an automatic-shift gear transmission.

An Engineer of the Weiss Engineering Association, description of an unconventional universal speed transmission.

JUNE 27
Morning

Subject—"Air-Cleaners."

Speakers—A. R. Squyer, Holt Manufacturing Co., testing of air-cleaners.

A. H. Hoffman, University of California Test Farm, results of the latest investigations of air-cleaning devices.

C. P. Grimes, United Manufacturing & Distributing Co., cleaners which function on the mechanical separation principle.

P. S. Tice, what a satisfactory air-cleaning device should do.

L. L. Dollinger, chief engineer of the Staynew Filter Co., why air-cleaners are an essential part of passenger car equipment.

Body Builders Stage Convention and Show

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operation which was given by the nine leading automotive associations and also scored the tariff regulations which have forced automotive manufacturers into paying tribute on every bit of aluminum, glass, oil, etc.

David Beecroft of the Class Journal Co. and Chilton Co. showed the effect of style on the motor car and the manufacturers' and dealers' business and Kingston Forbes of the Buick Motor Car Co. spoke on the trends of body engineering and the need for greater standardization. Stanley W. Nicholson of the Dura Co. covered the advances in window regulators and the need for greater standardization of window sizes and body.

During the afternoon session which was devoted to automobile body finish, L. V. Pulsifer of the Valentine Co. described the advances of varnish finishes, the standard and super-finishes of his company and in a brief manner mentioned a new all-nitro cellulose finish. E. M. Flaherty of the E. I. Dupont de Nemours & Co. discussed the methods of making cellulose nitrate and duco finish, giving some interesting figures on the cost of finishing bodies at the plant of the Oakland Motor Car Co.

An informal banquet was held at the Hotel Statler last night and new officers were elected during the executive session of Wednesday morning.

New Officers Elected

For the ensuing year, officers will be: President, James A. Daugherty, Robbins Body Corp.; First Vice-President, W. H. Ritter, English & Mersick; Second Vice-President, R. Johannesson, Textileather Co.; Third Vice-President, R. C. Getsinger, Getsinger-Fox Co.

The Executive Committee will be: Chairman, John B. Judkins, John B. Judkins Co.; Gordon F. Fairgrieves, Towson Body Co.; D. E. Humphrey, Ternstedt Manufacturing Co.; H. Millspaugh, Millspaugh & Irish Co.; C. G. Odell, Black & Decker Manufacturing Co.

Employs Phonograph to Reach Prospects

Packard Adopts Innovation as an Aid to the Efforts of Its Retail Salesmen

DETROIT, June 4—Through the medium of phonograph records the Packard Motor Car Co. will place before a large number of prospective buyers of cars talks by four of its leading factory executives. The records are now being manufactured for the company and will be ready for distribution, starting this month.

The purpose of the records is to supplement the activities of retail salesmen in placing before prospects the story of the Packard car, in a sense placing the factory definitely behind the salesman in his work with each prospect. The records may either precede the salesman or follow him, according to the factory's plans, but in either event they lend the additional weight of the executives to the salesman's effort.

Speakers on the records are Dr. H. H. Hills, vice-president in charge of distribution; Col. J. G. Vincent, vice-president in charge of engineering; E. F. Roberts, vice-president in charge of manufacturing, and H. N. Davock, general service manager. There are two records, each speaker giving a brief talk on one side of the record on the particular advantages of the Packard car from the viewpoint of his department's part in its production or sale.

Will Use Mails, Too

Through direct mail advertising the factory will direct the attention of prospective buyers to the fact that the records are available and, speaking for the dealer, request the opportunity of having them heard in the prospect's home. Following the hearing the records will be picked up and passed on or may be kept indefinitely if the prospect desires. The appearance of the dealer in connection with the distribution of the records gives opportunity for direct sales effort.

In originating its plan for using records as a means of assisting sales the company has considered the fact that there are some 22,000,000 phonographs in use in the United States and that a hearing may be had over a large number of these.

It has considered the advent of the radio, but knowing that phonographs are still selling in ever increasing number, regards the talking machine as of the utmost importance in spreading its educational efforts. About 150,000 prospects will be solicited for phonographic hearings in July.

Through the use of the records the Packard company hopes to extend its efforts greatly toward educating buyers to realize the advantages of buying higher priced standard cars.

38 Latin Americans Start Highway Tour

President Coolidge and Secretary Hughes Greet Road Commission in Washington

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commissioner of highways, State of Minnesota and Frank Page, chairman of the State Highway Commission of North Carolina.

The list of delegates who will make the tour are as follows:

Argentine—Manuel R. Balina, director of roads and pavements, Buenos Aires; Louis Eugeno Brenta, civil engineer, Buenos Aires; Roberto Kurtz, engineer and contractor of roads and bridges and Juan Augstin Valle, civil engineer of Argentine.

Bolivia—Santiago Aramayo, collector of internal revenue and Juan Rivero, engineer.

Brazil—A. F. de Lima Campos, civil engineer; Joaquim T. de Oliveira Penteado, inspector general of roads of Sao Paulo State and Theodoro A. Ramos, civil engineer.

Chile—Fermin Leon Martinez, chief engineer, Province of Valparaiso; Hector Vijil Olate, attorney and road builder and editor of the official magazine of the automobile clubs of Valparaiso and Santiago and Santiago Marin Vicuna, author of technical works on road building.

Colombia—Pablo Enrique Caicedo, director general, National Roads; Julio Fajardo, highway construction engineer and Alberto Roncallo, member board of Aldermen, City of Barranquilla.

Costa Rica—Ricardo Pacheco, engineer.

Cuba—Adolfo Arellano, head of firm of Arellano and Mendoza, Cuban contractors; Rodolfo Baquerizo Moreno, engineer and Armando Valdes, highway engineer.

Dominican Republic—M. A. Cocco, civil engineer.

Ecuador—Richard Frederic Antoine Muller, hydraulic and electrical engineer.

Guatemala—General Juan Bautista Padilla, director general of Roads.

Honduras—Manuel Angel Zelaya, civil engineer and former subminister of public works and head of the Railway Commission.

Mexico—Federico Garcia Cuellar, Army Engineer and now head of the National Construction Co.; Jorge Nunez, head of division of communications and public works of the National Government.

Nicaragua—Adolfo Cardenas, civil engineer.

Panama—Leopold Arosemena, engineer, and Tomas Guardia, engineer.

Paraguay—Alejandro Bibolini, civil engineer.

Peru—Carlos Oyague y Calderon, author, Peruvian road construction legislation and Federico Fuchs, director of highways.

Salvador—Manuel Lopex Harrison, highway engineer.

Uruguay—Donato Gaminara,. consulting engineer and dean of the engineering faculty, University of Montevideo and Agustin Maggi, civil engineer and bridge construction.

Venezuela—Dr. J. M. Ibarra Cerezo, director of highways and aqueducts and Dr. Alfredo Jahn, civil engineer.

Diplomatic representatives of many of the Latin American countries accompanied the delegates on its tour. Among them were the Ambassador from Argentine, Senor Dr. Don Honorio Pueyrredon; the Minister from Ecuador, Senor Dr. Don Rafael H. Elizalde; the Minister from Panama, Senor Dr. Don Ricardo J. Alfaro; the Charge d'Affaires from Brazil, Senor Don Samuel de Sousa Gracie; the Charge d'Affaires from Salvador, Senor Dr. Don Hector David Castro; the Charge d'Affaires from Nicaragua, Senor Don Manuel Zavala.

The itinerary of the party is as follows: North Carolina, June 4-10; Lexington, Ky. and Cincinnati, Ohio, June 11; Illinois, June 12, 13 and 14; Minnesota, June 15, 16 and 17; Wisconsin, June 18 and 19.

The delegates will then be taken to Detroit and several days spent in the automobile factories there and in Cleveland and two or three days at Akron.

Arrives in North Carolina

GREENSBORO, N. C., June 4—The demonstration of the American Road Builders' Association at the Central Fair Grounds opened here today with 70 exhibitors representing 89 manufacturers and including most makes of heavy-duty tractors and other automotive road equipment.

The Pan American delegation, today began a week's study of North Carolina highways. Arriving at Raleigh this morning, they were received by Governor Morrison, Frank Page, chairman of the State Highway Commission, and other officials. During the morning the delegates visited the State Highway Commission offices and the equipment shops and supply depots outside the city.

The party motored to Greensboro, arriving here early this evening, after making several stops en route to inspect 16 different completed Federal-aid and State road projects.

The delegates were guests of the local Chamber of Commerce tonight at a banquet. Each diplomatic representative was introduced by Dr. Julius Klein of the Bureau of Foreign and Domestic Commerce and made short addresses.

Governors Trinkle of Virginia and Morrison of North Carolina also spoke.

The party will motor to Yanceyville tomorrow to inspect two projects now under construction. The greater part of Friday will be spent at the road show. Friday afternoon the delegates will go to Winston-Salem.

Clubs Opposing Motorists' Merger to Continue N. M. A.

NEW YORK, June 3—Those clubs in the National Motorists' Association which were opposed to the merger with the American Automobile Association held a meeting here today with the object of continuing the N. M. A.

Officers were elected and the meeting went on record as advocating immediate and more stringent enforcement of laws relating to the overloading of trucks and suggesting the appointment of investigating committees to make recommendations upon the matter of adequate taxes to be levied on commercial vehicles "more commensurate with the damage they do to the highways."

No Change Expected at N. A. C. C. Election

Col. Charles Clifton Will Continue as President—Other Officers to Remain

NEW YORK, June 4—Preceding the annual meeting of the members of the National Automobile Chamber of Commerce, set for tomorrow, directors of the organization held their usual monthly meeting today to discuss routine matters and leave a clean desk for the new regime.

Production and sales occupied most of their attention, the estimate of 301,200 for May being about what was expected, while reports from throughout the country as to general retail conditions brought the prediction that business will be fair to good in both June and July, indicating that the industry is getting back to normalcy after the record breaking year of 1923.

Many Sales Below April

These reports indicated that May sales generally were smaller than either April of this year or May of 1923, although an increased demand in the southeastern section of the country was indicated. The decreased sales were credited to a slackening in general business, bad weather and poor roads.

It was reported that new car inventories are larger than they were in May of last year, with dealers in the South relatively less stocked than those in the remainder of the country. A pleasing note was struck when it was discovered that used car stocks were most commonly reported as the same or smaller than a year ago.

The truck industry report indicated that light truck prospects generally are fair, with heavy duty vehicles moving well in certain localities like Indianapolis, Cleveland, Omaha, Portland, Me., Minneapolis and Denver. New truck inventories, although larger than last year, are comparatively smaller than those of new passengers, while the stocks of used trucks on hand throughout the country are small.

It is not expected that the election of new officers tomorrow will result in any changes. It seems practically certain that Col. Charles Clifton will be re-elected to the presidency or that the other officers will be disturbed.

Directors Elected

NEW YORK, June 5—At the annual meeting of the members of the National Automobile Chamber of Commerce this morning the five directors whose terms had expired were reelected. They are A. J. Brosseau, A. R. Erskine, W. E. Metzger, R. E. Olds and Alvan Macauley.

The election of officers for the ensuing year will take place at a meeting of the new board immediately after the adjournment of the general meeting.

LOCAL CONDITIONS AFFECT CAR SALES

Cincinnati

CINCINNATI, June 4—The sales of automobiles in Cincinnati went along at about the same pace through the month of May as through April. Official statistics show that in Hamilton County, of which Cincinnati forms the major part, there were 1180 sales of new cars from May 1 to May 14, inclusive, as compared with 2394 for the entire month of April, 1924, and 2732 for May, 1923.

Estimates that have been made of sales during the last two weeks of May place sales for that period around the 1200 mark, which will make the sales for May about on a par with those during April, but considerably lower than during the same period last year. Almost without exception, May was a month of rainy, gloomy days, and the adverse weather conditions affected sales of automobiles. Industrial conditions in this city are also below normal for this time of the year, and curtailment of business in general has been felt by the automobile dealers.

A majority of the dealers in Cincinnati have a fair amount of stock now on hand, but if a spurt in sales comes, the supply will scarcely be equal to the demand. Used cars have been moving well at low figures. The small price that used cars are commanding has acted as a stimulus to the used car market locally. Dealers are not making the profits that they did last year, and the rest of the year is not likely to bring a radical change or a big upward swing in business, according to prominent Cincinnati dealers.

Indianapolis

INDIANAPOLIS, June 4—With May sales slowed up because of an entire month of bad weather, practically all dealers expect a better June than normally comes to this territory, where April and May are habitually record months of the season. In spite of this some lines have gone to new records during the last 30 days. City sales generally continue to lag behind country district figures, both in Indianapolis and in other industrial and commercial centers of the State.

Although there are glowing exceptions, the majority of dealers and distributors state that profits are smaller this year than in the past, due not only to used car conditions but to the increasing cost of obtaining both retail and wholesale business. Some of the more important concerns say that profits this year run at least 5 per cent below last year's records, in spite of greater sales in some instances.

A few dealers with extremely popular lines, in which sales are increasing rapidly, find profits better than last year, but without exception such concerns are extremely conservative on trade-in allowances and deduct at least 10 per cent for the reconditioning and selling of used cars accepted.

Thus increased business without increase in overhead and extreme care in handling used cars are causing a few concerns to forge ahead in profits, proving the exception to the rule. Another small class of profit-takers are dealers with larger discounts than normal, who are continuing to bid conservatively for used cars and refusing trade-ins for which there is little or no market.

A few dealers are balancing shrinking car sales' profits with increasing service and accessory sales and profits.

BETTER CONDITIONS RULE IN ST. LOUIS

ST. LOUIS, June 2—Sales of both new and used cars have picked up during the last month, and dealers here are well pleased with conditions. The weather still remains somewhat of an obstacle, but even this disturbing factor has not retarded sales to any alarming degree.

While stocks on hand are ample to take care of deliveries, dealers are not too heavily loaded up. In contrast with last year is the ability of the factories to fill orders quickly. In 1923 dealers were complaining bitterly over their failure to obtain needed cars, but this year they say they get what they need and when they need it.

Due to the continued drives of sales associations and other mediums, sales have been made on a profitable basis. Dealers are "selling" new cars and are not "buying" old ones.

Denver

DENVER, June 4—Although the new car sales volume in the Denver distributing territory evidently averages close to 20 per cent less for this May than for last May, net profits seem to be holding their own with those of a year ago. This is partly due to the fact that a greater number of dealers are more aggressively engaged in the selling of accessories along with cars.

An exceptional siege of nearly two weeks of rainy weather is blamed largely for the pronounced decline that marked the last of the month for Denver and vicinity. Many dealers count on overcoming this loss during June and July, which almost always are ideal motoring months. For the outside territory, the opening of mountain passes and extensive oil drilling developments already under way in new fields are relied upon to help business substantially in Colorado, New Mexico and Wyoming.

San Francisco

SAN FRANCISCO, June 4—Sales conditions are beginning to show some signs of improvement after the recent depression of nearly two months, due to the tying up of automobile traffic on the highways and roads by the quarantines incidental to the outbreak in 11 California counties of the foot-and-mouth disease among the herds of beef cattle and in the dairies.

Indications are that sales for May will run about 25 to 30 per cent ahead of those of May, 1923, but this increase is due to and proportionate to the increase in population caused by an annual immigration to this State of approximately 108,000 persons from other States who come here to live permanently.

Dealers in cars priced from $1,000 to $2,000 here believe that the foot-and-mouth epidemic and the drought, from which the whole State is suffering as the summer comes in, have reduced their sales by at least 40 per cent from what they would have been had not these two factors intervened.

Due to the monetary losses of cattle raisers, dairymen, fruit and vegetable growers, owing to the epidemic, and further to the losses of the grain and bean growers, due to the drought, many prospective buyers of new cars are "making the old car do" for another season. This, also, has cut down sales.

Columbus

COLUMBUS, OHIO, June 4—A canvass of the situation among passenger car agents and distributors shows that business is between 25 and 30 per cent less than last year at this time. Practically all dealers report a smaller volume of business ranging from about 15 per cent for the low priced cars to about 40 or 45 per cent for the cars selling from $3,500 and upward.

The falling off has continued for the last few months and is attributed largely to uncertain business conditions, although some distributors hold that weather conditions, which have been uniformly bad, contribute largely to the recession.

Farming communities are not showing up well, and in fact are worse than cities and larger towns as far as sales of new cars are concerned. Farmers as a rule are not in good shape to make purchases. Profits are correspondingly less but some of the dealers have already cut their overhead.

Stocks of new cars, as a rule, are not as heavy as a month ago, although in some instances they are abnormally high. Used cars are selling slightly better, stimulated by extraordinary sales methods, but the market is still draggy and remarkable concessions are being made by certain dealers to clean up.

DEALER PROFITS SHOW A FALLING OFF

Cleveland

CLEVELAND, June 4—Dealers in the Cleveland territory are making money out of the business they are transacting, but the sales are not so large and the profits are not so great as they were in the same period last year.

The bright spot in the automobile business in this territory is the used car situation. Stocks of used cars are said to be on an average of 50 per cent less than they were a year ago. The work of the Cleveland Automobile Manufacturers and Dealers Association through its used car bureau has had a salutary influence all through the trade.

The weather in May was again unseasonal, with temperatures below normal and the rainfall abnormal. This kept the people indoors and affected the demand for cars. Sales in May, in some instances, will run above the April figure, but on the average the amount of business will be about what it was last month.

May business this year will not equal the volume of the same month in 1923, but on account of the great volume done in the early winter months it is likely that the volume for the five months will run not much lower than it was in the same period last year.

Retail business in other lines in this city is not keeping pace with last year's volume. The automobile retailers are making a better showing than are the other merchandisers. The factories lowered their number of employees during May, but there is nothing alarming in the situation. Banks are still increasing their deposits and are saying that the stage is being set for a big run of business following the Presidential election.

Kansas City

KANSAS CITY, MO., June 4—Only a few motor car dealers are making money this year so far. New car sales are said to average about 30 per cent below 1923, and used car sales are about 20 per cent down. In many cases distributors are reporting country trade, through their retailers, close to normal, whereas their city retail business is 20 to 30 per cent off.

Under these conditions, many establishments are reducing overhead and closely scanning their outlays to produce a larger percentage of profit, on the assumption that trade will not increase materially this year.

Cold weather is still a factor in slow sales. Bad country roads due to heavy rains are a contributing factor.

Very many prospects are still holding off buying. Better weather will release these orders and will also promote demand and aggressive selling to people who would use cars on dirt roads.

Weather is not the only deterrent factor, however. General conditions are at a low ebb in this territory, due very largely to the fact that business men have put themselves into a state of suspended animation temporarily. They are not pushing sales (of hardware, apparel, dry goods, drugs, etc.), nor are they even keeping in close touch with old customers, because they assume that "people are not buying." Naturally the retailers take the same position as their wholesalers and assume that the public will not buy.

Some dealers expect the motor car business to pick up when the wheat is harvested and to improve more with other harvests. There is, in fact, this evidence of improvement already in small towns, where the good crop prospects have stimulated business. But other dealers say that the fine crops will not help business, unless they are moved at good prices, and the lack of foreign outlets for the production this year will offset the normal stimulation from harvests.

But the next harvest after 1924 will bring the big returns for everybody, and 1926 the people who have stuck it out this year will be flying high.

POLITICS AFFECTING BUSINESS IN BOSTON

BOSTON, June 4—June is looming up with the possibility of better sales conditions. May was wavy, with a few days bringing in orders in good volume, then letting down. Registrations show the tendency.

One year ago from May 1 to May 20 there were 26,966 cars registered for all Massachusetts. For the same period this year there were 26,042. In other words, in the first two-thirds of May of 1923 there were nearly 1000 more cars listed than this year. On the general assumption of sales May this year should have increased 10 to 20 per cent instead of showing a decline.

This does not mean that everyone is showing a falling off. Massachusetts, and in fact New England in general, is feeling the uneasiness which arises from political conditions.

In the outside territory sales are picking up due to the roads drying out, so that the belated sales that were supposed to be made during show week in Boston are just rolling in. This will help out to even up and so prevent any marked slump. But the dealers are not at all satisfied with conditions. On top of this to have notice served that prices are having a tendency to go up are not at all pleasing.

Milwaukee

MILWAUKEE, June 4—Motor car sales in Milwaukee and throughout the Wisconsin territory under the jurisdiction of Milwaukee distributors are becoming ever more confined to certain "standard" makes in the different price classes. May sales in almost all cases, even among the leaders, have fallen off considerably from the sales volume increases of the earlier months of the year. This is accounted for almost entirely by the extremely unseasonable weather throughout the month.

General business conditions are unfavorable, and profits are necessarily curtailed by the characteristics of the situation. While dealers employing modern and efficient business methods are doing well, those who have heretofore managed to survive with slip-shod methods are fast heading for financial straits. This situation has been becoming more and more acute during each of the succeeding recent years, and it is expected in local automotive circles that many of the poorer business men among the dealers will be forced out of business.

While the outlook for many dealers is gloomy, those who have been holding their own thus far are not only confident, but actually optimistic, in regard to the future. Sales are believed bound to pick up during the next few weeks, and many dealers and distributors expect at least to double their last year's sales records before the close of 1924. In some instances this year should see considerably more than double the 1923 business done.

Toledo

TOLEDO, June 4—Sales in the local automobile market have slowed up materially in most lines, as compared with a year ago. In the lower priced grades of cars, sales are going fairly well, but not up to the record, except in one or two cases. Some of the higher priced lines are selling at only about half the volume they did at the same time last year.

Profits have gone down with sales for the majority of dealers. A few have been able to cut expenses and are making profits out of the smaller turnover. Dealers in this territory have not had more than a few days of "straw hat" weather. Some think that whatever change the weather may bring, sales will not be affected much, as there is considerable talk abroad about changed models, which has brought on sales resistance.

There is hope expressed for a good fall business as the only optimistic outlook at the present time. The used car situation has remained exceptionally good, with sales holding their own and stocks keeping fairly low.

(*Conditions in other cities on page* 1259)

BANK CREDITS

Written exclusively for AUTOMOTIVE INDUSTRIES *by the Guaranty Trust Co., second largest bank in America.*

Further curtailment of industrial production is a feature of current reports. Retail trade showed increasing hesitation in the closing week of May, a condition which can be explained to a limited extent by unfavorable weather.

Wholesale prices continued to sag moderately last week, the Fisher index declining from 144.8 to 144.5. An indication of improvement in the relative prices of farm products is seen in the index of their purchasing power—farm prices of these products, compared with prices of non-agricultural commodities — compiled by the Department of Agriculture. After remaining at 74 in the first three months of the year (1913 = 100), the index advanced to 76 in April.

The official report of the cotton crop as of May 25, showing a condition 65.6 per cent of normal, was more unfavorable than was generally expected. The figure compares with a ten-year average for this date of 72.8 per cent. But favorable weather later in the season, of course, may result in a much larger crop than the present condition suggests.

Preliminary estimates record a decline of about 20 per cent in the rate of steel ingot production in May, as compared with a drop of about 30 per cent in April. At the end of the month the industry was operating at less than 60 per cent of capacity. Prices of steel and iron receded further last week.

Further expansion of crude petroleum production brought the daily average in the week ended May 24 to 1,980,200 barrels, an increase of 7550 barrels over the average for the preceding week.

Incomplete returns indicate a substantial reduction in railway earnings in April. Net income of 24 carriers was $19,000,000, as compared with $27,000,000 in March.

Call loan rates advanced sharply early last week, receding later to the previous week's level. Commercial paper rates ruled unchanged, ranging from 4 to 4½ per cent. The discount rate of the Federal Reserve Bank of Cleveland was reduced from 4½ to 4 per cent, placing it in line with the rate obtaining at the New York bank.

Allowance on Used Cars Is Estimated by Dodge

(*Continued from page* 1252)

must be obtained by deducting the sum of B plus C from A which is $426.

Our method of figuring used car values is based on long experience in buying and selling used cars and is eminently fair to everyone concerned. The owner receives a fair price and the used car buyer receives a thoroughly reconditioned car which we can endorse as sound value. Any owner who wishes to take the time and incur the expense of advertising his car, to make five to ten demonstrations, perhaps remaining at home evenings to do this, to take notes for 70 per cent of the price, can, after spending the money necessary to put the car in condition demanded by the buying public, sell his car at the same price we ask.

Remember that it is easy to get a higher allowance for a used car than it is worth by trading it in on a new car which carries an inflated selling price. Dodge Brothers motor car lists prices are not inflated to cover used car allowances but do reflect only true value. We cordially solicit your business on the basis outlined above. By adhering to these policies we protect our good name and assure you honest treatment and continued good service.

As part of the campaign is some direct-by-mail literature which the dealer may obtain from the factory and which goes to the prospective customer, picturing some reconditioned Dodge Brothers' models which may be purchased, and also setting forth reasons why cars are traded in by original owners.

FINANCIAL NOTES

Kelsey Wheel Co. has declared the regular quarterly dividend of $1.50 on the common, payable July 1 to stock of record June 20.

Fisher Body Ohio Co. has declared the regular quarterly dividend of 2 per cent on the preferred, payable July 1 to stock of record June 19.

Jordan Motor Car Co. has declared the regular quarterly dividends of 75 cents a share on the common and 1¾ per cent on the preferred, payable June 30 to stock of record June 14.

Eaton Axle & Spring Co. has declared a quarterly dividend of 40 cents, payable July 1 to stock of record June 15. This is 15 cents under what was paid previously. The company, however, states that its earnings during the last three months were approximately double the 40 cent dividend but because of general business conditions the directors adopted a conservative policy.

Stromberg Carbureter Co. of America, Inc., reports a net profit of $204,306 after reductions, for the first quarter. This is equal to $2.72 a share earned on 75,000 shares of no par stock and compares with $254,528, or $3.39 a share for the first quarter of 1923. The consolidated balance sheet shows $4,384,328 in assets, of which $620,992 is cash, $442,829 notes and accounts receivable and $788,290 inventories.

Meachem Gear Acquires Weekes-Hoffman Plant

SYRACUSE, N. Y., June 4—The Meachem Gear Corp of this city has taken over the plant of the Weekes-Hoffman Corp. The capitalization of the company is to be increased from $100,000 to $500,000.

The company, which has been producing rawhide gears since 1919, will produce service gears for automobile repairs and continue production of industrial gears.

When the New Process Gear Corp. was organized Meachem Gear took over all the industrial work which the concern had been handling. T. G. Meachem, former vice-president and general manager of the New Process Gear Co., is head of the Meachem Gear Corp.

Plan of Moline Plow for Future Outlined

George N. Peek Resigns as President—Smaller Company Due After Reorganization

MOLINE, ILL., June 4—Directors of the Moline Plow Co. this week announced a sweeping reorganization which will release about $4,000,000 for retirement of securities against the company and mean capitalization of the corporation as a much smaller unit with only $3,500,000 stock.

Retirement of George N. Peek, for five years president and general manager of the company, a generally recognized figure in the agricultural implement manufacturing industry of the Middle West, complete readjustment of the plant with curtailment of many of its departments and elimination of overhead expenses through centralization of all its work in one unit, will be immediate results of the application of the new policy.

Johnson Becomes President

Announcement of the action of the board and its future plans was made from Chicago by Gen. Hugh S. Johnson, former vice-president, who now succeeds to the presidency and will direct the new process. The statement follows:

The board of directors of the Moline Plow Co., Inc., has decided to sell those units of the company which have been operating at a loss and to create by readjustment of the profitable units, a new and smaller company which will confine its operations to those lines which the company has operated successfully for over 50 years.

When completed this action will make about $4,000,000 available to security holders and will leave the new and smaller company capitalized at about $3,500,000 with ample assets for its operation. It is understood that new interests are considering the purchase of this smaller company with a view to its operation.

Reduction in size and operations cause a much less important overhead organization than was needed by the larger company. For this reason, George N. Peek, one of the outstanding figures of the implement industry, has tendered his resignation as president and the general executive organization is being materially curtailed.

Hugh S. Johnson will be in charge of the company and of the process of reorganization, assisted by R. W. Lea, vice-president. H. B. Dineen will be in charge of manufacturing operations of the smaller company and P. H. Noland will be in charge of sales.

Sale at Tractor Plant

The Moline Plow's decision to dispose of its outlying and nonprofitable plants was made some time ago and the company only last week conducted an auction at its Universal Tractor plant in Rock Island with a net return estimated at $500,000. Bids are reported to have been submitted also for its Freeport, Ill., plant operating as the Stephens Motor Co. and its Poughkeepsie plant.

Sales Conditions

Des Moines

DES MOINES, IOWA, June 4—Better weather has helped Iowa automobile dealers to increase sales somewhat, but business is still far from satisfactory. In general, the dealers in the larger cities of the State have enjoyed the best business.

A tour over the southwestern part of Iowa found the majority of dealers in the smaller Iowa cities with excessively heavy stocks of used cars. One dealer in a town of less than 6000 population reported 54 used cars on hand. New car sales, while suffering in comparison with last year's business during the same months, is better than during the first months of the year.

The poor condition of Iowa banks in some of the smaller towns has done much to discourage business. Several more banks were declared insolvent last month. Bank failures have not only hurt business in the locality of the failure, but have been disturbing to adjoining sections of the State. The public has become distrustful of the small banks and are adopting a watchful waiting policy toward buying. Dealers feel that even the small increase in price put into effect by some manufacturers will make sales resistance greater.

It is a self-evident fact that the majority of Iowa dealers have not made money so far this year. Repair shops continue to be the most profitable item in the automobile business. Many dealers are turning their attention to better shop management, believing that a well-managed repair shop will show a profit.

Los Angeles

LOS ANGELES, June 4—Dealer mortality in southern California is increasing, three dealers in one city having suspended business one week recently. Reports from various localities indicate that several more dealers will not survive the summer months. In some instances the reason for this state of affairs is ascribed to buying conditions, but in others inability to liquidate the stock of used cars on hand is said to be the cause.

Sales by Los Angeles dealers on the average are approximately 20 per cent less than at this time last year. The State motor vehicle department reports the increase in registrations this year over last is only about 3 per cent as compared with a normal increase of 20 per cent. Local dealers are reluctant to discuss financial matters, but undoubtedly with many of them if there is a margin of profit from new car sales it is very small.

One of the largest distributors has been advertising for used cars to be traded on new sales. This is a very pronounced departure from his previous business methods and is in direct contrast to some other dealers who have been trying to discourage trade-ins. There is no intimation of anything approaching a panic in the local situation, but it is evident more than ever before that automobile merchandising will be continued only in proportion to the dealer's ability to maintain financial support.

Detroit

DETROIT, June 4—Retail sales in Detroit for May will show a recession from the total in the same month last year, according to preliminary estimates of dealers. Sales in the first 15 days of the month were definitely under those of the early period last year, and while business was better in the latter part of the month, it was not exceptional enough to bring the whole month up to the high totals of last month.

The outlook for June is that sales will continue to show reductions under the last year's total. The falling off in business in May and June, however, does not mean that business is bad. Cars are being moved in considerable volume, especially in the lower priced line, but the heavy deliveries of the early part of the year took much of the total that otherwise would be coming through now.

Used cars have been selling in volume, as compared with the deliveries of new cars, but there are still many used cars to be sold. Prices for used cars are lower almost generally, and for the most part their movement entails sacrifices by dealers. Low priced car dealers are most heavily stocked with used cars.

Dealers are not making money as a general rule, such as has been made in other years, and the reason generally ascribed for this is that there are too many associated dealers handling the same lines. There is not enough volume for all to make money, and there is a feeling that this condition will result in reduced representation of the popular lines.

Philadelphia

PHILADELPHIA, June 4—Considering the promising start automobile dealers in this territory made earlier in the season, present business conditions may be characterized as decidedly disappointing. Unemployment and generally decreased industrial activities in various lines apparently have had a sharply restrictive effect on purchasers of cars by wage-earners, and a larger percentage of the passenger cars now being sold is taken by professional and salaried men.

A few of the dealers merchandising high grade cars assert that their business is holding up well, although some say that deliveries are exceedingly slow from factories. Two or three of the low-priced car agencies continue to do remarkably good business, but most of the dealers handling automobiles of this grade complain of poor business. The same may be said of dealers handling medium-priced cars.

Agents in the smaller cities and towns of the State appear to be the hardest hit of all, and some go so far as to state that no less than 90 per cent of the sales made involve a trading proposition. As the general condition in used cars throughout Pennsylvania, and especially in and around Philadelphia, is that of being considerably overstocked, the used car problem is a hard one. Profits are below last year at this time because of it.

A large percentage of automobiles are being sold on time. Summing up, slow turnover of new cars and constant trading in by customers, with consequent inability of dealers to dispose of such cars accepted because of the glutted condition of the market, are factors in showing less profit than at this time last year.

Michelin Increases Balloon Tire Sizes

Addition by French Company Meets Requirements of 75 Per Cent of Cars in France

PARIS, May 24 (*by mail*)—In addition to the three sizes of balloon tires now on the market, the dimensions of which are 715 x 115, 730 x 130, and 775 x 145, Michelin is about to add a fourth which, like the others, will be clincher bead type, of 860 x 160.

These four sizes will meet the requirements of practically 75 per cent of French cars, replacing all high pressure tires up to 120 mm. section.

At the present time 75 per cent of the light two-seater cars built by Citroen, Renault and Peugeot are delivered with balloon tires, while the last named firm is planning to make balloon tires standard equipment on all its small cars.

Up to this date practically no big cars, with a rating of more than 15 hp., have been equipped with balloon tires, but Goodyear is preparing to put on the market American-made straight side balloons for the biggest types of cars. The attitude of French motorists at present is that balloon tires are likely to be dangerous on really fast cars.

INDUSTRIAL NOTES

Stitt Ignition Co., Columbus, Ohio, manufacturer of spark plugs, has awarded a contract for the erection of a large addition to its plant which will eventually double its capacity. The addition is two-stories and 160 x 35 feet. Additional machinery will be installed. It is expected to have the addition completed by Aug. 1 if not earlier.

Oneida Motor Truck Co., Green Bay, Wis., has changed its name to the Oneida Manufacturing Co. following its pending retirement from the truck manufacturing field. It probably will make about 100 trucks this year to fill orders as they come in, after which it will devote its energies to the production of gasoline railroad motor coaches.

Anderson Engine Co. of Chicago has moved into new quarters at 4236 Lincoln Avenue, where it has added facilities for designing and manufacturing Anderson engines.

Calendar

SHOWS

Jan. 3-10—New York, National Automobile Show, under the auspices of the National Automobile Chamber of Commerce, Bronx Armory.

Jan. 24-31—Chicago, National Automobile Show, under the auspices of the National Automobile Chamber of Commerce, Coliseum and First Regiment Armory.

FOREIGN SHOWS

May 31-June 15—Turin, Italy, Automobile Show.

Aug. 23-Sept. 6—Toronto, Ont., National Automobile Show in conjunction with the Canadian National Exhibition under the sanction of the Canadian Automotive Equipment Association and the Automotive Industries of Canada.

Oct. 2-12—Paris, passenger cars, motor cycles, bicycles and accessories, Grand Palais.

Oct. 17-25—London, Annual Passenger Car Show, Olympia.

Oct. 22-31—Paris, motor trucks, stationary engines, garage tools and machine tools, Grand Palais.

RACES

June 14—Altoona.

July 4—Kansas City.

Aug. 3—Lyons, France, European Grand Prix.

Sept. 1—Altoona.

Sept. 1—Syracuse.

Oct. 4—Fresno.

Oct. 19—Kansas City.

Nov. 24—Los Angeles.

CONVENTIONS

June 24-27—Atlantic City, American Society for Testing Materials.

June 23-25—National Team and Motor Truck Owners Association.

June—Washington, Pan American Highway Congress, under the auspices of the Pan American Highway Mission.

Sept. 7—Monza Track, near Milan, Italy, Italian Grand Prix.

Sept. 8-11—Eaglesmere, Pa. Annual Meeting of the Automotive Electric Association.

Sept. 22-26—Boston, Sixth Convention and International Steel Exposition of the American Society for Steel Treating.

Jan. 7—New York, Convention under the auspices of the National Automobile Dealers Association, Hotel Commodore.

Jan. 26-29—Chicago, Eighth Annual Convention of the National Automobile Dealers Association, Hotel LaSalle.

S. A. E. MEETINGS

June 24-27—Summer Meeting of the S. A. E., Spring Lake, N. J.

September—New York City, S.A.E. Automotive Transportation Meeting.

Oct. 21-24—S. A. E Production Meeting, Detroit.

Nov. 18-19—Joint Service Meeting of the S. A. E. with the N. A. C. C. Cleveland.

—Aeronautical Meeting at Dayton at the time of the Pulitzer Races.

January—S. A. E. Annual Meeting, Detroit.

15 Cars at Finish In Endurance Tour

(*Continued from page* 1253)

amination showed not more than one pint of water missing and the oil clear.

Studebaker special led Class D endurance, finishing the journey with a penalty of 2 points which resulted when the pilot purposely stopped his engine while behind a traffic jam. The penalty is under protest.

Buick topped everything in Class C endurance by making a perfect performance while the light Studebaker led in economy with 101 gallons of gasoline consumed.

In Class B the Maxwell led in endurance with 8 points, resulting from two refillings of the radiator in the last day's run and engine stall. Oakland led the class in economy having a three gallon margin over Maxwell at the close.

Of the total of 256 points penalized against all entries, 90 points were for work on cars, the Paige being the heaviest sufferer with 25 points. Ninety-five points were accounted for by lateness of the Oakland, Nash, Chrysler and Lincoln in arriving at the Globe night control while only 18 points resulted from engine stalls. Of nine engine stops for which penalties were inflicted during the tour only four were engine stalls while —the others resulted from errors made by drivers.

Thirty points resulted from replacement of parts, the Lincoln being the heaviest suffered with 20. The Willys-Knight was the only car penalized for taking on oil out of control as the result of an accident. Oakland, Overland, Maxwell and Chevrolet received the balance of the penalties for taking water out of control.

TIRE FABRIC DEMAND GOOD

ATLANTA, GA., June 4—Though the textile industry has been decidedly inactive in the South during the last two months due to adverse conditions, mills manufacturing fabric for use in the manufacture of automobile tires are operating for the most part at near capacity, and in some instances on day and night schedules, to supply the northern tire plants.

There has been little abatement among mills making tire fabrics in the last few months, with the largest of the plants located in Georgia all having ample business in hand to insure steady activity for an indefinite period.

Cars for Madrid, Spain, Require Left Hand Drive

WASHINGTON, June 4—All automobiles shipped to the Madrid district in Spain should be equipped with left hand drive, due to the change in the city traffic laws, Assistant Trade Commissioner in Charge Burke cables the Automotive Division of the United States Department of Commerce.

He says that effective April 15, traffic in the streets was changed from left to right. Madrid previously was the only city in Spain where traffic bore to the left instead of the right, and due to this condition American manufacturers in some instances furnished their Madrid representatives with cars installed with the right hand drive.

MACHINE TOOL EXHIBIT

NEW HAVEN, CONN., June 2—The fourth annual machine tool exhibit run under the joint auspices of the New Haven branch of the American Society of Mechanical Engineers, Yale University and the New Haven Chamber of Commerce will be held Sept. 15-18 in Mason Laboratory of Yale University. "Greater Production" will be the keynote of the papers read at the evening sessions.

TESTING MATERIALS MEETING

NEW YORK, May 31—The twenty-seventh annual meeting of the American Society for Testing Materials will be held at Atlantic City June 24-27.

Tire Output Reduced Earlier Than Usual

(*Continued from page* 1252)

timistic regarding the showing to be made during the year.

American Rubber & Tire Co. reports production at approximately 90 per cent of capacity after several months of somewhat reduced output.

C. W. McLaughlin, organizer of a new rubber company, announces that the new company will be ready to purchase a plant within the near future.

Retail Conditions Better

NEW YORK, June 2—From replies to the questionnaire sent out by the National Automobile Tire Dealers Association on April 30, conditions among the retailers are improving. The replies indicate that stock on hand has been decreased, while a large increase in sales is reported. General business conditions, say the retailers, are "about fair."

President George J. Burger is investigating the discrepancy between the surveys taken by his association and the Rubber Association of America as to the stock on hand among the retailers on the first of the year. The investigation of the dealer association showed that its members were carrying approximately 400 tires per dealer, which, multiplied by 60,000, the estimated number of retailers, would indicate 24,000,000 tires on the shelves on Jan. 1.

The Rubber Association's estimate, covering a wider area, approximated 12,000,000. Mr. Burger admits that there may be closer to 50,000 dealers than 60,000, so, revising this estimate because of this, he thinks that stock Jan. 1 totaled 20,000,000 casings.

Because of this wide discrepancy, Mr. Burger is urging his members to cooperate with the Rubber Association on the next survey. It is his belief that the larger dealers carrying stocks on hand of 500 tires and more, did not answer the Rubber Association's last questionnaire.